



WESTMINSTER

Staff Report

TO: The Mayor and Members of the City Council

DATE: March 12, 2014

SUBJECT: Study Session Agenda for March 17, 2014

PREPARED BY: J. Brent McFall, City Manager

Please Note: Study Sessions and Post City Council meetings are open to the public, and individuals are welcome to attend and observe. However, these meetings are not intended to be interactive with the audience, as this time is set aside for City Council to receive information, make inquiries, and provide Staff with policy direction.

Looking ahead to next Monday night's Study Session, the following schedule has been prepared:

A light dinner will be served in the Council Family Room 6:00 P.M.

CITY COUNCIL REPORTS

1. Report from Mayor (5 minutes)
2. Reports from City Councillors (10 minutes)

PRESENTATIONS

6:30 P.M.

1. Municipal Court 2013 Annual Report
2. Total Compensation Philosophy Presentation
3. Proposed Comprehensive Plan Update
4. Recommendation for Strategic Plan Consultant (*verbal*)

EXECUTIVE SESSION

1. Discussion of strategy and progress on negotiations related to the Westminster Urban Center Redevelopment and the possible sale, acquisition, trade or exchange of property interests, and provide instructions to the Authority's negotiators as authorized by CRS 24-6-402 (4)(a) and 24-6-402(4)(e) – (*Verbal*)

INFORMATION ONLY ITEMS

1. 72nd Avenue/Raleigh Street Bridge Replacement – Construction Phasing
2. Alternative Energy Fleet Study and Vehicle GPS System
3. Monthly Residential Development Report

Additional items may come up between now and Monday night. City Council will be apprised of any changes to the Study Session meeting schedule.

Respectfully submitted,

J. Brent McFall
City Manager

NOTE: Persons needing an accommodation must notify the City Manager's Office no later than noon the Thursday prior to the scheduled Study Session to allow adequate time to make arrangements. You can call 303-658-2161 /TTY 711 or State Relay) or write to mbarajas@cityofwestminster.us to make a reasonable accommodation request.



W E S T M I N S T E R

2013 ANNUAL REPORT

MUNICIPAL COURT

**3030 Turnpike Drive
Westminster, CO 80030**



TO: Mayor and City Council

FROM: John A. Stipech, Presiding Judge
Carol J. Barnhardt, Court Administrator

DATE: March 17, 2014

SUBJECT: 2013 Municipal Court Annual Report

This report is a compilation of the activities of the Municipal Court from January 1 through December 31, 2013.

CASELOAD



Safe and Healthy Community

City Council Objectives:

§ Maintain citizens feeling safe anywhere in the City

Performance Measurement Goal: Process cases in a timely and efficient manner. Effective case flow management helps ensure that every litigant receives procedural due process, and equal protection, and is safe within our City.

CASE FLOW

Case flow management is the process by which courts move cases from filing to closure. This includes all arraignments, pre-trial phases, motion hearings, trials, sentencings, and events that follow disposition to ensure the integrity of court orders and timely completion of post-disposition case activity.

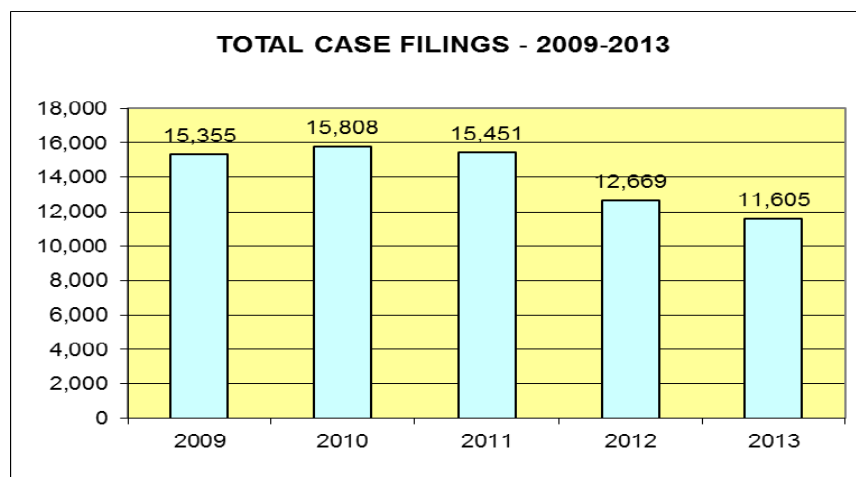
Effective case flow management makes justice possible not only in individual cases but across judicial systems and courts. Effective case flow helps ensure that every litigant receives procedural due process and equal protection.

Summonses are issued by the Westminster Police Officers, and the Court does not have any control over the number of summonses issued.

CASE COMPARISONS OF NEW FILINGS FOR LAST FIVE YEARS

The chart below represents a comparison of total new case filings, including criminal, traffic and parking cases, over the last 5 years.

In 2013, overall, we experienced an 8% decrease or 1,064 fewer new case filings than in 2012. However, we experienced increased filings in domestic violence cases and traffic mandatory cases.

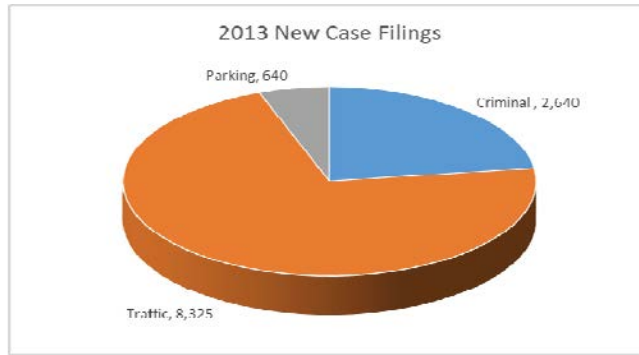


The Westminster Police Department provided the following information regarding the number of summonses written in 2013. The decrease in new case filings for 2013 can be attributed to the continuing construction on US-36, on Sheridan Boulevard, and on other city streets. The H.O.V. (High Occupancy Vehicle) lane on US-36 was essentially non-existent due to the construction and continual moving of the barriers. Proper signage does not exist and makes enforcement difficult and dangerous. The construction and constant reconfiguration of the roadway has slowed people down because of uncertainty. The Neighborhood Enforcement Program has taken officers off from the main streets more so than in the past. The Police Department reported that before the implementation of this program, they received several complaints that the Police Department was not responding to their needs. The feedback the Police Department receives from officers and citizens is positive, and the accountability for the complaints has been invaluable to the Police Department.

The number of new domestic violence case filings increased. In 2012, there were 272 new case filings. In 2013 there were 333 new case filings. This is a 22% increase or 61 more new cases filed. Information regarding the possibilities for the domestic violence filing increase in numbers was obtained from the City's Police Victim Services Coordinator, and she indicated that the increase in domestic violence cases for our Municipal Court this year may be a result of Westminster Police Officers and Detectives preference to file cases in our Municipal Court rather than either of the two county courts. In addition, there has been an increase in the calls for domestic disturbances which also results in an increase in arrests.

The number of new cases filed per year does not fully explain the court's workload or time to process some cases from filing to conclusion. A new case may contain multiple charges, and additional charges may be added by the Prosecutor at any time prior to trial. These types of cases often result in additional hearings, resulting in additional judicial and staff time. Due to the complexity involved with many of these cases, and also the domestic violence cases, coupled with the fast tracking, and the need for public defender representation on many of the cases, more hours are required by all staff involved.

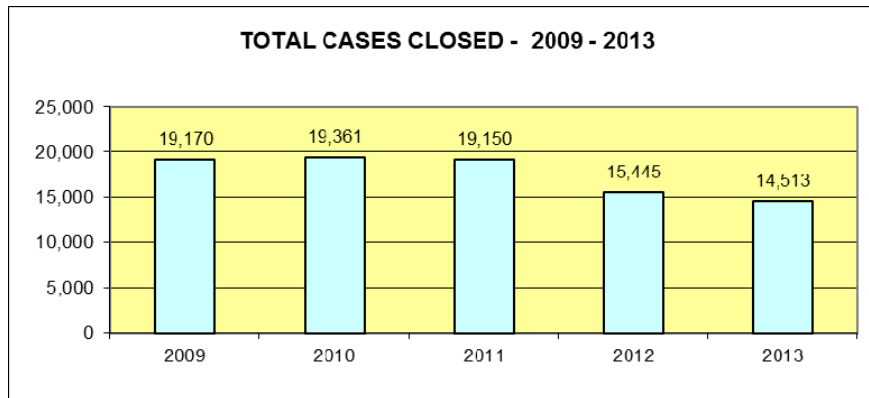
The pie chart below represents the total new case filings by type. Criminal cases include all Municipal Ordinance and Domestic Violence filings. Traffic cases include Traffic Mandatory (criminal traffic violations such as speed contest, speeding greater than 24 miles per hour, reckless driving, careless driving, compulsory insurance, eluding a police officer, and school bus violations, and all accident violations); all traffic payable cases (all other violations not listed in the traffic mandatory category); and all parking violations.



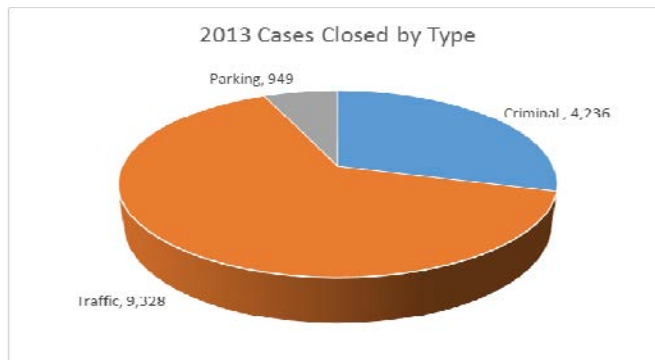
CASE COMPARISON OF ALL CASES CLOSED FOR LAST FIVE YEARS

The chart below represents a comparison of total cases closed including criminal, traffic and parking cases over the last 5 years. This includes cases closed from 2009 through 2013.

In the chart below, 2013 year-to-date information indicates that 6% or 932 fewer cases were closed than for the same period in 2012. The decrease in cases closed correlates to the decrease in filings. The new cases filed measured against the cases closed helps us assess how well cases are being processed from filing to closure.



The pie chart below represents the total cases closed by type.



COLLECTION EFFORTS

The Court's reputation, integrity, and public trust depend in part on how well court orders are observed and enforced in cases for non-compliance. In particular, restitution for crime victims and accountability for enforcement of monetary penalties imposed by the judges are issues of concern. The Court enforces its orders and payment in full is due at the time of sentence. If defendants are deemed to be indigent or financially unable to pay, the Court may impose sentences such as community service, or may reduce or waive fines and fees.

When defendants do not pay as required, the case is referred to the private collection agency and the defendants incur an additional 25% fee based on the amount owed. There is no expense to the City. Monitoring delinquent accounts supports the integrity of court orders and holds the defendants accountable to pay the judgments imposed by the Court.

Collection Summary

Staff reported that for the year 2013, a total of 809 cases were electronically exported to the collection agency. Total payments received from collection efforts were \$95,732. Of that amount, \$19,146 was the fee sent to the collection agency. The court collected \$76,586 in payment of fines, costs, restitution and other fees.

JURY TRIALS, WITNESS AND JURY FEES

Jury trials are scheduled every Thursday in Courtroom B and every other Thursday in Courtroom A. This schedule enables the Court to dispose of up to six jury cases per month. We have been able to process cases as timely as possible and avoid dismissals as a result of speedy trial timelines.

JURY STATUS CONFERENCES AND JURY TRIALS

Every Wednesday, jury status conferences are held for all cases scheduled for jury trial that week. At this scheduled hearing, the defendant and/or his/her attorney are required to attend. Witnesses do not appear at this hearing. The purpose of this hearing is to rule on pending motions, to accept a plea, or to continue a case, if necessary. The jury status conference reduces calling in jury panels unnecessarily, and resolves preliminary matters before the jury trial date. The total number of potential jurors appearing during the 2013 year for jury services was 978.

At the conclusion of jury trials, the selected jurors are provided with a Jury Exit Questionnaire asking them to voluntarily rate their jury experience in the areas listed below. Jurors may also provide comments. On a monthly basis, the information is forwarded to the Court Administrator and General Services Director for review, and the summary is then forwarded to the Judges and Staff for their information. Information below is a compilation of the information gathered from the Jury Exit Questionnaires.

Westminster Municipal Court - Jury Service Exit Questionnaire Summary

January 1 through December 31, 2013

RATINGS ON THE FOLLOWING:	Excellent	Good	Adequate	Poor
Initial Notification Process	61	25	4	0

Orientation (video presentation)	56	29	5	1
Treatment by Court Personnel	83	7	0	1
Overall Jury Trial Experience	56	31	3	1

GENEROUS JUROR INFORMATION

The Generous Juror Program began in 2002 offering jurors the opportunity to donate their jury service fees to a City selected charity. Annually, a new charity is selected by City Council. Organizations chosen include:

- Have-A-Heart Project (July 2002 to September 2003)
- The Link (October 2003 to December 2004)
- Westminster Burn Fund (2005)
- Light for Life / Yellow Ribbon Foundation (2006)
- District 50 Education Foundation (2007)
- Have-A-Heart Project (2008)
- Westminster Legacy Foundation for use as scholarship funds for Armed Services Memorial Garden bricks for veterans (2009)
- Have-A-Heart Project (2010)
- Westminster Legacy Foundation (2011)
- Growing Home (2012)
- The charity selected for 2013 was the Have-A-Heart Project. The total amount donated was \$2,841.



Financially Sustainable City Government Providing Exceptional Services

City Council Objectives:

§ Invest in tools, training and technology to increase organization productivity and efficiency.

In response to many jurors failing to appear for service and the potential of having inadequate jury panels, in 2010, Deputy Court Clerks began making reminder calls. To reduce staff time spent calling jurors, technological support was researched. In 2011, the Court, in partnership with the Department of Information Technology, implemented the Court Partnership Calling Project (CPCP). This partnership established an automated calling system to prospective jurors. Jurors receive an automated phone call on Monday evenings between 6 p.m. and 8 p.m. reminding them of their upcoming jury service. Jurors are instructed to call the Court the Wednesday evening before their scheduled Thursday jury trial service to confirm that their services will be required.

GENERAL INFORMATION ABOUT JURY TRIALS

YEAR	NUMBER OF JURY TRIALS SCHEDULED WITH JURORS APPEARING	NUMBER OF JURY TRIALS HELD
2009	48	42

2010	59	45
2011	61	49
2012	51	38
2013	51	42

WITNESS FEES AND JUROR EXPENSES

YEAR	BUDGETED EXPENSES	ACTUAL EXPENSES
2008	\$8,068	\$6,600
2009	\$8,068	\$8,261
2010	\$7,568	\$7,785
2011	\$7,568	\$7,193
2012	\$7,568	\$6,253
* 2013	\$7,568	*\$6,760

* 2013 budget totals not finalized at the time of this report.

APPEALED CASES

An appeal is a request usually filed by a defendant and filed in the Adams County 17th Judicial District Court requesting the appellate court to review the ruling of a Westminster Municipal Court Judge. The review is based solely on the record of the hearing or trial held and is not a new trial.

Appeals must follow State Statutes and Colorado Rules of Criminal Procedures Rule 37, and Colorado Municipal Court Rules and Procedures, Rule 237.

During 2013, there were 10 cases in appeal status. One (1) case was remanded for further proceedings, four (4) are pending, and five (5) appeals were dismissed.

PROBATION SECTION



Safe and Healthy Community

City Council Objectives:

§ Maintain citizens feeling safe anywhere in the City

Performance Measurement Goal: To effectively supervise criminal offenders by reducing recidivism and increasing successful completion of probation.

Westminster Municipal Court Probation Section provides a myriad of services to individuals, the Court, the Prosecutor’s Office, and defendants from pre-sentence information to supervision of probationers. Failure to comply with probation terms and conditions may result in the revocation of probation and the imposition of sentences including the possibility of a jail sentence. Juveniles face up to

ten days in detention and up to a \$1,000 fine. Adults can receive up to one year in jail and up to a \$1,000 fine. Costs are assessed in addition to fines.

A Pre-Sentence Investigation (PSI) is ordered when a judge requests more information about a defendant before imposing sentence. A Probation Officer interviews the participants in the incident, checks the defendant's prior criminal record and personal background, compiles the information in a report and provides a sentencing recommendation to the judge. The Probation Clerk schedules the date the defendant is to attend the pre-sentence interview and the date for the sentencing. During 2013, the Probation Section completed 49 Pre-Sentence Investigations at the request of the Judges.

The Judges have the option of sentencing a defendant to supervised probation or unsupervised probation. Supervised probation is a more intensive option that requires defendants to report in person to their Probation Officer a minimum of one time per month for adults or every other week for juveniles. Unsupervised probation requires defendants to attend a 45-day review, and if they are in compliance, they are allowed to report via monthly reporting forms that they return to the Probation Section.

The Probation Section has a volunteer program that allows interested citizens to apply to become Volunteers In Probation (VIP), to learn to supervise cases and gain experience in the probation field while giving back to the community. Training for new VIP's is held each spring and fall, as needed, and involves 16 hours of initial training followed by monthly training and staffing.

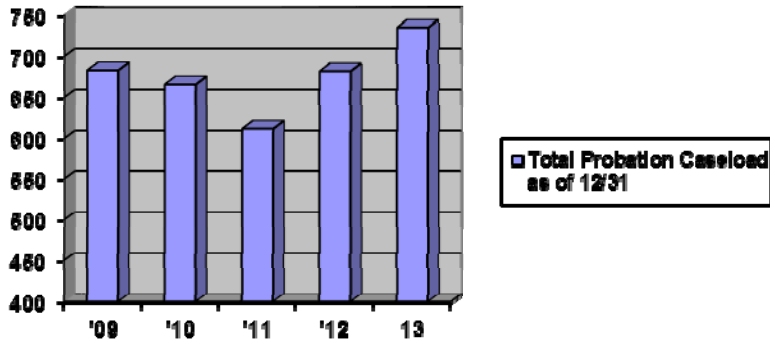
Caseload statistics are tracked on a monthly basis instead of a year-to-date basis to most accurately reflect the current workload of the Probation Section by documenting the number of active probation cases at the end of each month. This number changes daily as new probationers are placed on probation while others successfully or unsuccessfully complete probation.

During 2013, the Probation Section responded to violations of probationers in two days or less, 88% of the time, which is below their target of 95%. An increase in supervised caseloads and considerable unexpected staff absences that required two Probation Officers to cover three caseloads for at least three months of the year contributed to the drop in response time. In 2013, the Probation Section had a 62% successful completion rate for cases that closed. This is above their target success rate of 60%.

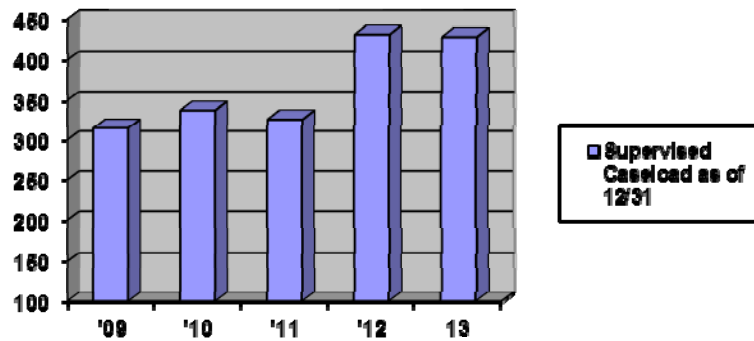
Petitions to Revoke Probation: The Probation Section is unable to track the number of Petitions to Revoke Probation filed throughout the year. If this statistic were to be tracked, that number would not accurately reflect success or a lack of success in a case because revocations are filed for several reasons. Some revocations are filed to prompt a probationer to become compliant with the terms and conditions of probation, and then the revocation may be withdrawn once compliance occurs. Some petitions are filed to keep a case open at the end of probation to allow a probationer to complete requirements and then the petition is withdrawn and the case closes successfully. Many revocations result in a probationer being reinstated back on probation and given another opportunity to succeed and potentially close their case successfully.

The total probation caseload, consisting of both supervised probation and unsupervised probation, as of December 31, 2013, was 735, which was at its highest level in five years and above the five year average of 676. The supervised probation caseload maintained itself at 428 cases, above the average of 367 cases over the past five years.

Graphical and statistical information for the Probation Section follows. The first chart is a historical reflection of the total number of both supervised and unsupervised probation cases.



The second chart is a historical reflection of the total number cases that are on Supervised Probation.



The month-end statistical data for the Probation Section follows.

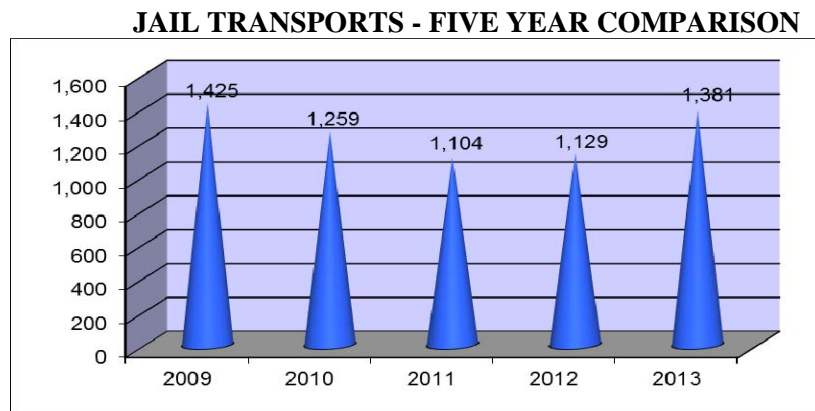
	MTD	MTD	
PROBATION	Dec-13	Dec-12	Difference
Total active caseload in probation	735	682	8%
Total active Domestic Violence on probation	251	198	27%
Number of active Volunteers In Probation (VIP)	7	8	-13%
Cases currently supervised by VIPs	7	5	40%
Supervised probation caseload	428	431	-1%
Unsupervised probation caseload	300	246	22%
Total adult caseload	584	477	22%
Total juvenile caseload	151	205	-26%

JAIL TRANSPORTS

Every business day, the three Court Marshals (Westminster Police Officers assigned to the Court) transport prisoners arrested on original warrants, bench warrants, or are in-custody from other jurisdictions that have to appear at our Court. The Court Marshals are highly trained and experienced officers that substantially contribute to the smooth functioning of the judicial system.

The caseload and necessity to transport numerous prisoners impacts every aspect of the Court operation. It also directly impacts the Prosecutor's Office, the Victim Advocate, the Court Marshals, and the Court's dockets including interpreter hearings and public defender cases.

The total transports for 2013 were 1,381. The chart below indicates an increase of 22% or 252 more total transports in 2013 than in 2012. This statistical information was provided by the Lead Court Marshal.



SECURITY



Safe and Healthy Community

City Council Objectives:

§ Maintain citizens feeling safe anywhere in the City

Performance Measurement Goal: Staff, citizens and customers are safe and secure when at the Court building.

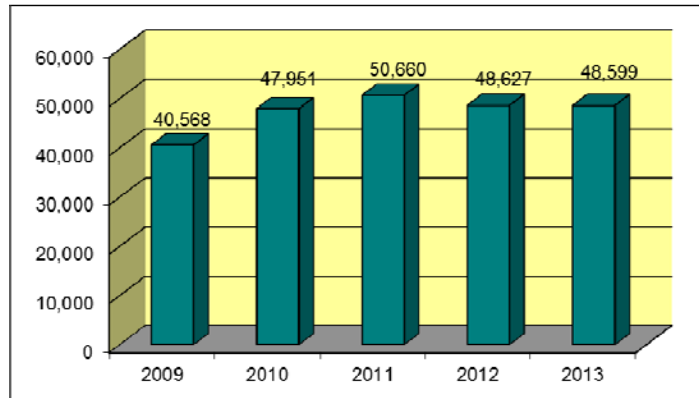
Our customer service includes a security screening process conducted by a private security company. All individuals entering the Court facility must pass through a metal detector, must have all bags and coats checked, and are hand scanned, if necessary. The security guards also check for contraband, weapons and other prohibited items or paraphernalia as part of their screenings. This process is similar to airport security and most other court facilities.

Hand scans decreased because of a procedural change in screening established this year. Due to the high number of times the metal detector detects the area of footwear the individual is wearing, the security officers will visually observe the individuals footwear and pass them through or the individual may be scanned depending on the type of footwear. Some footwear (including some sandals) have metal toes or heels that often set off the alarm. This process is being reviewed and re-evaluated for 2014.

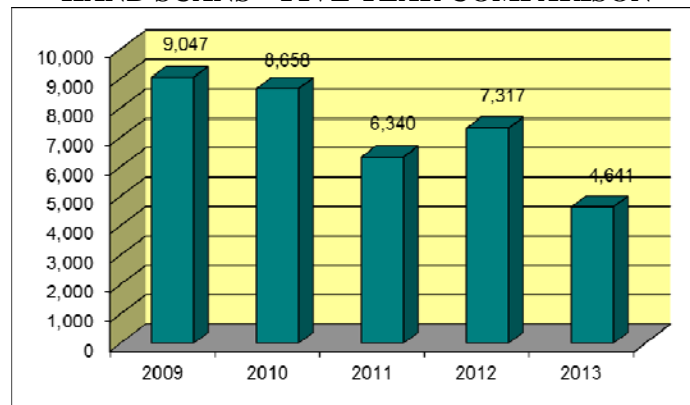
We are working together with the security company and the security guards to make certain that they demonstrate and embrace our SPIRIT values in their contacts with our customers.

The three charts below give a historical comparison for the past five years.

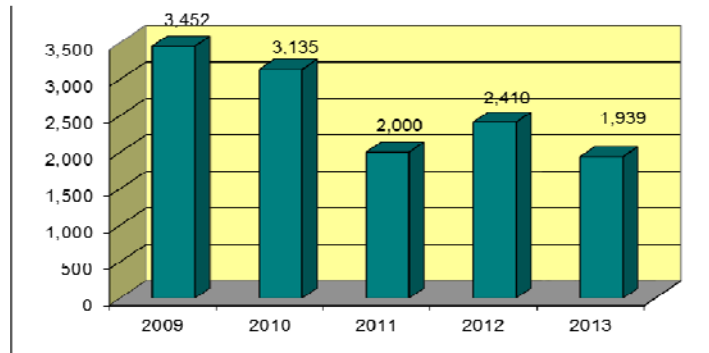
CUSTOMERS – FIVE YEAR COMPARISON



HAND SCANS – FIVE YEAR COMPARISON



CONFISCATED ITEMS – FIVE YEAR COMPARISON



CONFISCATED ITEMS BY CATEGORIES

The following information is a breakdown, by category, of the different types of items that were confiscated or returned to the customer's vehicle.

The 3 weapons and 47 rounds of ammunition belonged to a Denver Police Officer appearing on personal business and two Jefferson County Sheriffs appearing on personal matters. All three officers were given the options to either lock their weapons in the Court Marshal lock boxes or to return their weapons and ammunition to their vehicles.

Knives	340	Handcuffs	11
Scissors	40	Handcuff keys	30
Screwdrivers	24	Firearms	3
Razors	75	Ammunition	47
Mace Canisters	63	Cameras	105
Tools or clubs	147	Other prohibited items (nail files, combs, hair picks, sharpies, alcohol, glass, etc.)	931
Chains	123		

CUSTOMER SERVICE

Our top priority is to service the public in the most professional, efficient, and effective manner possible. The Court is different from other City departments or divisions. Usually, individuals appear at City facilities because they are seeking information or a service. Those appearing at court have either been issued a summons or a subpoena to appear. We realize that few individuals want to appear at court and we attempt to make the experience as pleasant as possible, if not enjoyable.

Our primary concern is to assure that customers have a fair court experience. Our customers include citizens, jurors, defendants, witnesses, victims, victim advocates, police officers, attorneys, parents, children, service providers, volunteers, consulting agencies, the judges and staff. We strive to have everyone feel they were treated with respect and dignity.

Language interpreters are scheduled, when necessary, for the arraignments, pre-trial conferences, probation conferences, dispositions, and trials. In order to facilitate the large number of Spanish speaking individuals, we schedule every other Monday afternoon for Interpreter Hearings in Courtroom B. The Court also utilizes the services of a telephonic interpreter company that can provide interpreters for approximately 165 languages. Some of the various languages interpreted are Hmong, Laotian, Russian, German, Polish, Vietnamese, Chinese, and various other languages.

SENTENCING OPTIONS

The Court attempts to consider alternative sentencing options. Listed below are the sentencing options utilized by the Judges:

- Fines, fees and costs (may be assessed and then suspended)
- Restitution to the victim(s)
- Community Service, may be in lieu of fines and/or costs, either with the City or a non-profit agency
- In-Home Detention for non-aggressive and/or first time offenders
- Jail (straight time or authorized work release)
- Probation (supervised or unsupervised)
- Evaluations (Alcohol, Substance Abuse, Mental Health)
- Domestic Violence Counseling (mandatory on pleas and /or convictions). Effective September 1, 2010, all defendants sentenced to Domestic Violence Counseling are required to complete an evaluation with a certified domestic violence counselor to determine the level of treatment. From this assessment they will be placed in varying groups based on their individual needs. The minimum length of treatment is four months as long as all competencies have been met.
- Substance Abuse Counseling
- Anger Management Counseling

- Mental Health Counseling
- Monitored Sobriety such as: SCRAM (Secure Continuous Remote Alcohol Monitor), which is a 24 hours transdermal alcohol monitoring system, Antabuse (medication to help control alcohol use), BAs (Breathalyzer that tests blood alcohol), UAs (Urinalysis)
- Alive at 25
- Online Traffic School
- ISAE (Institute for Substance Abuse Education) for Adams County offenses or NCTI (National Correctional Training Institute) for Jefferson County offenses offer 1 day (Theft, Conflict Management, Decision Making, Traffic, Animal Management) or 2 day (Theft and Conflict Management) educational classes
- Diversion Programs for defendants under 21 charged with first offense drug and/or alcohol violations. Providers are: North Metro Youth Diversion Program for Adams County and Y-DAP (Youth Drug Abuse Prevention) for Jefferson County
- Essays about the class or the crime
- Apology letters
- School or GED requirements
- Job search or employment requirement
- Specific research papers
- Order to Comply (such as with another probation order, possess no graffiti paraphernalia, maintain a specific grade average at school, obey the rules at home, etc.)
- Trespass Orders (usually for a retail establishment)

EMPLOYEE RECOGNITIONS

LENGTH OF SERVICE

The City hosts luncheons to recognize employees who have reached 5, 10, 15+ years of service with the City. At the luncheon, each department head recognizes employees in their department with a short recap of what they have accomplished at the City and the individuals' hobbies and interests outside of work. All employees receive a certificate and a pin designating the number of years they have been with the City.

5 Year Recognition

Bernadette Tedesco – recognized 4/24/13



Debbie Mitchell, Bernadette Tedesco, Brent McFall

10 Year Recognition

Paul Basso - recognized 4/24/13



Debbie Mitchell, Paul Basso, Brent McFall

15 Year Recognition

Debbie Clayton – recognized 6/12/13



Debbie Mitchell, Debbie Clayton, Brent McFall

KEY FOUNDATIONS CERTIFICATES

This past year, Vanessa Hamilton and Judy Smith completed the City’s Key Foundations Program. To earn this certification, employees completed courses including Mission Statement and SPIRIT Values, Strategic Planning, Performance Measures, Westminster 101, 202, 303, and completion of an Implementation Question. Employees exemplify who we are, what we value, and how we deliver services by understanding the City’s Strategic Plan, how we measure performance, and by being ambassadors for the organization.



Vanessa Hamilton and Judy Smith

LEADERSHIP DEVELOPMENT PROGRAM

On December 10, Probation Clerk Judy Smith graduated from the City’s Leadership Development Certification Program. The program covered several aspects of leadership such as 360 Feedback and Discussion, Leadership from Within, Emotional Intelligence, Leadership and Ethics, Organizational Essentials, Effective Communication, Leadership through the Generations and through

Influence, Transitioning Roles, Leadership through Change and Building Resilience, and the final group presentation. The graduating class of 21 encompassed employees from various City departments.



Rachel Harlow-Schalk, Judy Smith, Brian Poggenklass

JUDICIARY

The Court has one (1) full-time Judge, one (1) .8 FTE Judge, and four (4) Pro-Tem Judges. The Pro-Tem Judges are available to cover for vacations, illnesses, conferences, meetings, and other situations as needed.

- The Honorable **John A. Stipech** has served as Presiding Judge since 1996.
- The Honorable **Paul Basso** has served as Associate Judge since February 2003.

PRO TEM JUDGES

- The Honorable **Jeffrey Cahn** (current Boulder Municipal Judge) has served as Pro-Tem Judge since April 2003.
- The Honorable **Randall Davis** (former Broomfield County Judge) has served as Pro-Tem Judge since December 2006.
- The Honorable **Emil Rinaldi** (former Adams County Judge) has served as Pro-Tem Judge since January 2009.
- The Honorable **Dennis Wanebo** has served as Pro-Tem Judge since January 2011.

COURT ADMINISTRATOR AND SUPERVISORS

The Court Administrator, supervisors, support staff and volunteers are outstanding individuals who continue to go above their assigned duties to promote customer service and exemplify SPIRIT.

The administration of the Court is led by Court Administrator **Carol Barnhardt** within the General Services Department, reporting to the General Services Director **Debbie Mitchell**. The Court Administrator's supervisory team includes Deputy Court Administrator **Debbie Caldwell** and Probation Supervisor **Brian Poggenklass**. Collections Supervisor **Susan Wooster** resigned in April 2013. The new Court Financial/Technical Supervisor **Debbie Olguin** joined the supervisory team in August 2013.

In January 2013, we welcomed to our court team **Debbie Caldwell** from Broomfield to fill the Deputy Court Administrator position that was created by the retirement of the previous Administrator in August 2012. Mrs. Caldwell has 17 years of experience in the judicial system, with the majority of her

experience having been in the Broomfield Municipal Court. Her experience provides invaluable assistance to the Court Administrator and the Court team.

On August 12, 2013, we welcomed the newest member of our supervisor team, **Debbie Olguin**, as the new Court Financial/Technical Supervisor (new title change). Mrs. Olguin brings 7 years of experience as a State Court Collection Investigator and has previous banking and collections experience. Her experience provides invaluable assistance to the Court Administrator and the Court team.

The Court team works in partnership with all City departments. They have an excellent working relationship with the Judges and have been invaluable in conducting the day-to-day proceedings and operations.

DEPUTY COURT CLERKS

The Court is staffed with well trained and skilled employees who work diligently to process the caseload. The Deputy Court Clerks are assigned and cross-trained on the following responsibilities: probation clerk, cashiers, data entry clerks, overdue clerk, motions clerk, phone and jury clerk, CBI (Colorado Bureau of Investigations) clerk, criminal clerk, and courtroom clerks.

The Deputy Court Clerks are:

- **Stevee Casey**
 - **Debbie Clayton**
 - **Amber Creasey**
 - **Michelle Garcia**
 - **Kathryn Gamelin** (started 1/16/2014)
 - **Art Gomez** (resigned August 2013)
 - **Vanessa Hamilton**
 - **Lucienne Lyons** (resigned 1/2/2014)
 - **Tanya Navarro**
 - **Jennifer Ragan**
 - **Gail Reynolds**
 - **Grace Salinas**
 - **Judy Smith** (current probation clerk)
 - **Regina Stephenson**
 - **Bernadette Tedesco**
- **Carol Jones** is a temporary Deputy Court Clerk as of April 24, 2012. Mrs. Jones covers the front cashier counter and answers phones for approximately 2 hours per month for our monthly staff meetings.

COURT VOLUNTEERS

We are very appreciative of all of our volunteers and the hours they donate. The volunteers are very dedicated to their tasks. For 2013, these volunteers donated **127.75 hours of service**.

- **Doree McCall** assisted with docket pulling and various other duties. Doree has been a volunteer since September 1992.
- **Melissa Irwin** assisted with quality control and laserfiched closed cases. Melissa was a volunteer from November 2011 through June 2013.

PROBATION SECTION

- **Brian Poggenklass**, Probation Supervisor (adult cases)
- **Tracy Cutshaw**, Probation Officer (domestic violence cases)
- **Kimberly Lif**, Probation Officer (juvenile cases – on medical leave)
- **Jesse Vialpando**, Temporary Probation Officer (juvenile cases)
- Probation Clerk is a rotating Deputy Court Clerk position

VOLUNTEERS IN PROBATION

For 2013, the Probation Section had 11 Volunteers in Probation (VIP) who donated a total of **183.8 hours of service**. These volunteers help enforce court orders and provide limited mentoring to probationers and monitor compliance with the terms and conditions of probation by meeting with probationers twice per month at the court. The volunteers also write brief reports and attend monthly hearings and trainings. We again are very appreciative of the time, effort and energy expended by these individuals.

The volunteers are listed in alphabetical order below:

- | | |
|---|---|
| <ul style="list-style-type: none"> ● <i>Tammie Badjar</i> ● <i>Vikki Ehrhart</i> ● <i>Peggie Elizondo</i> ● <i>Shana Hall</i> ● <i>Jennifer Heinrick</i> ● <i>Deborah Johnson</i> | <ul style="list-style-type: none"> ● <i>Amanda King</i> ● <i>Janis Landers</i> ● <i>Patricia Murphy</i> ● <i>Hannah Reynolds</i> ● <i>Carole Schultz</i> |
|---|---|

REVENUES AND OPERATING EXPENSES

The revenues and operating expenses for 2009 through 2013 are listed below.

REVENUES

	2009	2010	2011	2012	2013
Projected Revenue	\$2,000,000	\$2,050,000	\$2,120,000	\$1,950,000	\$2,095,000
Actual Revenue	\$1,855,673	\$1,875,617	\$2,087,893	\$1,861,668	\$1,723,726

OPERATING EXPENSES

	2009	2010	2011	2012	2013
Projected Expenses	\$1,517,098	\$1,503,280	\$1,480,381	\$1,508,373	\$1,507,671
Actual Expenses	\$1,445,968	\$1,445,023	\$1,409,499	\$1,424,189	\$1,432,720

2013 PROJECTS, CHALLENGES AND ACCOMPLISHMENTS

- **Adams County Jail Issues** – The Presiding Judge and Court Administrator, along with other City officials, participated in continuing meetings and discussions regarding the Adams County Municipal prisoner/inmate issues. This continues to be a time-consuming and laborious issue, and the outcome is crucial to our Court and City operations.
- **Annual Report** for 2012 was prepared and presented to City Council on March 4, 2013.
- **Audits** – The Court supervisory team and staff completed audits on open files, collections cases, open protection orders, open warrants and probation cases. The audits help assure accuracy and completeness of all files.

- **Adoption of revisions to W.M.C 1-8-1** (maximum fine amount). Legislative changes under HB 13-1060 increased the maximum fine that a municipal court may impose for a municipal ordinance violation from \$1,000 to \$2,650, and added the ability for municipalities to adopt automatic inflationary adjustments to that maximum. In October 2013, the Court Administrator and City Attorney's Staff met and discussed the necessity to update and change the maximum fine amount in this ordinance. The ordinance was adopted to increase the fine to \$2,500 effective January 1, 2014. Changes in this ordinance necessitate the revision of several Court forms.
- **BO&M projects** –This year's projects included painting of the west basement jail area, painting the lobby outside of both courtrooms, and painting the public restrooms.
- **Customer Service Survey** – A Customer Service Survey was conducted during the month of October 2013. The survey asked the customers to rate the service they received in different areas of the Court, as well as their overall satisfaction. The areas concentrated on were the courtrooms, cashiers/collections, and probation. Ratings were based upon on customer greeting, knowledge of staff, satisfaction with the outcome, and fairness and demeanor of the Judges and Probation Officers. Customers received the survey when they entered the building and were asked to leave it with us when they left the building. Nearly 300 customers evaluated our services. Overall, the results were favorable. The majority of the customers feel our services are excellent or good in all areas. Utilizing the results from this survey enabled us to improve some of our services and continue to ensure we fulfill our mission statement and achieve the values of the City through SPIRIT.
- **FullCourt Enterprise** – On February 13, 2012, we implemented a major upgrade to the FullCourt Enterprise records management system. Another major update to Version 5.1 has been installed on the test database and will be tested in January of 2014 with implementation by the end of January 2014.
- **Reminder Calling Project** – In November, we implemented an automated system to call defendants and remind them of upcoming court dates. The intent of this project is to reduce the number of individuals that fail to appear on their court dates. The project is too new to evaluate at the time of this report.
- **Staffing** – During 2013, we hired four new employees, the Deputy Court Administrator, Court Financial/Technical Supervisor, Deputy Court Clerk, and temporary Probation Officer.

Three of our *major challenges and accomplishments* for 2013 were:

1. JAILS AND BED SPACE CHALLENGES: Adequate jail space to effectively protect our community. (City Strategic Plan – Safe and Healthy Community).

This has been an on-going issue with Adams County since August 2011. The Sheriff's views of access to beds differs from that of the various municipalities, and this issue is an on-going disagreement between the Sheriff and the Adams County Board of Commissioners.

The Court Administrator and supervisors continue to monitor our jail beds every day, including weekends and holidays.

2. STAFFING SHORTAGES CHALLENGES: (City Strategic Plan – Safe and Healthy Community).

This year was challenging for all of the employees in the Court operation. We hired a new Deputy Court Administrator in January. The Court supervisory team was then short-staffed one supervisor from April until August when the new Court Financial/Technical Supervisor was hired. One of our Deputy Court Clerks left in August to join the City Attorney's Office team and that position remained vacant until December. An employee in the Probation Section has been out most of the year

for medical reasons, leaving that section short staffed one Probation Officer. We were able to hire a temporary Probation Officer in December to assist the Probation Section.

3. TRAINING ACCOMPLISHMENT: (City Strategic Plan– Financially Sustainable City Government Providing Exceptional Service – Invest in tools, training and technology to increase organization productivity and efficiency).

The main training project for this year was to arrange the Court schedule to allow our staff to move forward with training to build a collaborative team environment. This project was a joint effort between Human Resources staff, the Judges, Court Administrator, Court supervisors, and all of the Court Clerks and Probation Officers. This project began in 2012.

TRAINING PROJECT

With the approval of the Deputy City Manager and the General Services Director, four afternoons were scheduled in 2013 for training:

- April 15 from 2 p.m. to 5 p.m. (Employee Development and Benefits Manager Lisa Chrisman facilitated, trained and reviewed what was established in 2012)
- June 10 from 2 p.m. to 5 p.m. (Lisa Chrisman facilitated the training based on the April meeting)
- August 5 from 12:30 p.m. to 6 p.m. – Community Service Project - *A Precious Child* located in Broomfield. Their mission is to make a positive impact in the lives of disadvantaged and displaced children by improving their quality of life. They provide services to families in Adams, Broomfield, Jefferson, and four other counties. This was an eye-opening experience for many of us and a reality check on how fortunate we are in our lives.
 - Our tasks in this project included organizing school supplies and filling backpacks. We filled approximately 500 backpacks, cleaned up the storage area, sorted and hung up various items of clothing in another part of their facility.
 - Participants included 20 Court employees including both Judges, and three Court Marshals. We provided approximately 69 man-hours of service to enhance our team building training and support the community.
- October 14 from 2 p.m. to 5 p.m. (Lisa Chrisman facilitated training, reviewed our accomplishments, wrap up, evaluations, and discussed plans for next year)

During three of our four trainings, the Court facility remained open to the public. There were no afternoon court dockets scheduled, and our temporary Deputy Court Clerk was at the Court to assist citizens at the window and answer phones.

2014 OUTLOOK

We will approach and proceed into 2014 with a positive and proactive attitude. The *major projects and goals* we will be working on in 2014 are:

1st Quarter

- Review Fail to Pay warrants processes and procedures, including, but not limited to, adding more hearing dates into our courtroom schedules
- Plan and organize on-going Performance Enhanced Partnerships (PEP) training
- Test and upload FullCourt Enterprise to Version 5.1
- Prepare and present the Court's Annual Report
- Capital Improvement Project (CIP) – Potential CIP security projects include, but are not limited to: upgrade and install more security cameras and monitoring system; evaluate the need to replace

the metal detector at front entrance; enhance the DVR equipment as needed; evaluate the need to replace or enhance card readers, burglar alarm system, and panic alarms

2nd Quarter

- Prepare a 5 year strategic plan for 2014-2018
- Recruit volunteers to assist with laserfiche and quality control of closed files
- Test and upload FullCourt Enterprise patches and new versions

3rd Quarter

- Create a Request for Proposals (RFP) for the public defender services
- Create a Request for Proposals (RFP) for front security services

4th Quarter

- Test FullCourt Enterprise purge module and purge past retention cases

On-going

- Continue training of the Deputy Court Administrator and Court Financial/Technical Supervisor
- Continue to train and cross-train Clerks
- Review and revise procedure manuals
- Continue to move forward with building a collaborative team environment
- Continue to monitor, train and test the FullCourt Enterprise records management system
- Conduct and complete numerous audits to verify accuracy and completeness of court records
- Laserfiche and quality control closed files

SUMMARY

The Court experienced several personnel changes this past year. We are fortunate to have some very highly qualified individuals join our team, and we are fully staffed at the time of this report. We engaged in several partnerships with other departments, specifically the Information Technology Department in implementation of our records management system. The City Attorney's Office has been working on code revisions and developing a better working relationship with the Court in delivering quality service for our citizens. We received outstanding support from Debbie Mitchell and the General Services Department, the City Manager's Office, City Attorney's Office, Building Operations & Maintenance Division, Finance Department, the Police and Fire Departments, and other City departments. Numerous City employees from various departments or divisions have continued to provide outstanding support and assistance to meet our needs.

We are striving to continue to be prepared to provide outstanding services to our citizens in a fair and impartial manner. It is our goal to provide a fair venue and experience to all citizens, litigants, witnesses, jurors, attorneys, and other customers appearing before the Court, and arrive at decisions based only upon the law and the evidence presented at the various hearings and trials.

We are appreciative of the continued support of City Council and are receptive to any concerns that Council may have.

We look forward to 2014 and will continue partnering with various departments, agencies and entities.



WESTMINSTER

Staff Report

City Council Study Session Meeting
March 17, 2014



SUBJECT: Total Compensation Philosophy Presentation

PREPARED BY: Debbie Mitchell, Director of General Services
Lisa Chrisman, Employee Development and Benefits Manager
Dee Martin, Workforce Planning and Compensation Manager

Recommended City Council Action

City Council is requested to listen to Staff's overview of the current total compensation philosophy and market survey processes and to provide direction on any modifications to the strategies or philosophy as Staff begins work to develop biennial budget recommendations for 2015 and 2016.

Summary Statement

The Westminster Strategic Plan goal of maintaining a Financially Sustainable City Government Providing Exceptional Services includes a primary objective of "Maintaining a values driven organization through talent acquisition, development and management". Maintaining a quality workforce is the engine for exceptional service delivery to the citizens of Westminster. A critical component to ensuring that the City maintains a quality workforce is by providing a market based and comprehensive total compensation package. The City strives to provide a total compensation package comprised of competitive wages, a quality and affordable benefits package and a team oriented work environment that supports our employees.

General Services Staff will be in attendance at Monday's Study Session to provide an in depth review of the total compensation philosophy and employment package currently in place. Criteria and processes utilized to develop recommendations will be presented. City Council direction and input is requested in preparation for planning and research of wage, benefits and working environment expenditure items for the upcoming biennial budget development.

Expenditure Required: \$0

Source of Funds: N/A

Policy Issue

Is City Council in agreement with the current total compensation philosophy and data analysis strategies and criteria?

Alternatives

Direct Staff to maintain the current total compensation philosophy and data analysis strategies and criteria. Direct Staff to pursue different priorities with regard to employee total compensation packages and/or funding levels as identified by City Council.

Background Information

Maintaining a quality workforce is the engine for exceptional service delivery to the citizens of Westminster. The City has a long standing commitment to recruiting, developing and retaining top talent enabling the City to provide responsive, strategic service delivery to the community. The City seeks to attract and retain diverse, quality employees by providing a competitive total compensation package focused on the following three key areas:

- Competitive market-based wages;
- Quality, comprehensive and affordable benefits; and
- Superior work environment.

Staff has worked with City Council to ensure that these areas are developed in a manner that is sustainable and supports our values-based workforce. City Staff evaluates other competitors in the market to ensure our wages allow us to attract and retain top talent in the region. While wage is one of the largest commitments in the City's budget, the total rewards approach recognizes that employees are seeking a more comprehensive employment offering. Work environment, benefits, meaningful work, opportunity for advancement plus a work culture that supports family and lifestyle needs are key to attracting and retaining quality staff.

The total compensation approach provides benefits to employees with a long term view of employment as demonstrated through the financial commitment to pension, general leave, major illness and disability benefits as well as comprehensive employee development and advancement opportunities. Healthcare costs are a significant concern of employers. The City has proactively worked to mitigate and contain costs in this area through an award winning Wellness Program, a comprehensive Employee Assistance Program and aggressive healthcare program management most recently demonstrated through the development of an on-site employee health clinic. Employees enjoy a work environment where long term commitments have been made to state of the art equipment, vehicles, and facilities. Employees have the freedom to be innovative and as a result take pride and ownership in the quality and level of service they provide to the community. Focus groups have told us that one important reason they stay and thrive at the City are the employees with whom they work. Common values and an emphasis on a quality culture are key motivators for many.

Current budgetary commitments to employee compensation packages include:

- Over \$60 million in regular salaries for benefited employees;
- Over \$1.5 million in overtime wages;
- Over \$10.5 million in employee healthcare and other insurances; and
- Approximately \$5.8 million in pension contributions.

These specific commitments to employee compensation are not all inclusive and do not take into consideration the total benefits package and related expenses to creating a quality work environment.

Staff will be present at the study session on Monday evening to outline specifics regarding the compensation philosophy, wage and benefits package, work environment commitments as well as processes used to evaluate market competitiveness. City Council direction and input is requested in preparation for planning and research of wage, benefits and work environment expenditure items for the upcoming biennial budget development. The total compensation package is essential in allowing the City to recruit and retain quality staff that support all of the strategic objectives.

Respectfully submitted,

J. Brent McFall
City Manager



Staff Report

City Council Study Session Meeting
March 17, 2014



SUBJECT: Proposed Comprehensive Plan Update

Prepared By: Sarah Nurmela, Senior Urban Designer

Recommended City Council Action

Provide input to Staff on proposed Comprehensive Plan updates. Direct Staff to prepare an ordinance for adoption by City Council regarding the proposed Comprehensive Plan revisions for 2014.

Summary Statement

- The current Comprehensive Plan was adopted in November, 2013. This plan represents a cohesive update to the 2004 Comprehensive Land Use Plan.
- Staff proposes that maintenance updates to the Comprehensive Plan be completed on an annual basis in the first quarter of every year.
- This first maintenance update to the Comprehensive Plan focuses on clarifications to new land use classifications introduced by the 2013 Comprehensive Plan update as well as map updates reflecting recent open space acquisitions and transfers of designation. Additionally, this update will address the land use designation for the Brookhill Focus Area. Other minor edits include word, spelling and map legend edits.
- A major component of the proposed Comprehensive Plan changes is the clarification of new land use classifications introduced with the 2013 adoption. Seven new designations were added, many that address new land use typologies within the City. The proposed revisions focus on clarifying the intent and application of these uses through minor text edits and additional notes and information in the associated development standards tables.
- A policy consideration introduced as part of this update is that of the land use designation for the Brookhill Focus Area site. Currently, the Brookhill Shopping Center is designated Mixed Use Center, which reflects the City Council's desire to show a vision for revitalization and potential redevelopment on the site. As improvements to the site have been proposed, some conflicts with the development standards for the Mixed Use Center classification have surfaced that will impact current and future attempts to improve existing retail commercial development on the site. Staff proposes an alternative land use designation for the site, Mixed Use, to maintain the City's vision for the Focus Area while accommodating retail commercial development and incremental improvements.
- A detailed list of the proposed changes is outlined in the background section of this report, listed in Attachment A and shown in Attachment B.

Expenditure Required: \$0

Source of Funds: N/A

Policy Issues

Does the City support annual updates to the Comprehensive Plan? Should the City move forward with proposed clarifications and updates to the newly adopted Comprehensive Plan in 2014?

Alternatives to the Update Process

The City could choose an alternative schedule or an as-needed approach versus an annual update and document maintenance process for the Comprehensive Plan. The intent of the proposed annual updates is to ensure that the document is a “living” document and responsive to the City’s strategic planning. While the annual updates are meant to be minor text or map revisions, there will be opportunities to address key issues that may arise with respect to Plan implementation, customer service or other aspects of the City’s physical planning efforts. Updating a document after several years, which could extend to five or ten years, could result in a more significant time outlay as opposed to yearly maintenance and revisions. On the other end of the spectrum, not having an established update process (such as the regularly planned annual Zoning Code updates), could result in constant amendments to the Comprehensive Plan, creating additional work output for Staff and less ability to contemplate changes to the document in a cohesive manner.

A second alternative could entail an annual cohesive update to the Plan, which would include more intensive analysis of land use, economic markets, traffic and demographics. This update would be similar in scope and intensity to the 2013 update process, which was an almost 12-month process. This process would likely include consultant input on technical analyses for the economic market and traffic, in addition to significant staff time for community outreach and land use analysis. Additionally, annual updates and changes to land uses, in particular, would reduce predictability for landowners both for their own properties and their neighbors or surrounding area.

Alternatives to the Proposed Updates

The City could choose to not support all or some of the revisions to the Comprehensive Plan. There are several types of changes proposed that include word and spelling edits, map and table edits, clarifications to land use classification descriptions, and a change in land use for a Focus Area. If the proposed changes do not move forward, retaining the Plan as is will have varying impacts, which include the following:

- Text and spelling edits: these edits will not significantly impact the document, although a few could impact the clarity of references to specific tables or maps and the resulting understanding of what they illustrate;
- Map and table edits: these edits are primarily to update land use information with respect to open space purchases, so the impact of not completing these will mean the document does not reflect existing conditions accurately;
- Clarifications to land use classifications: the edits proposed to the land use classifications are directly related to implementation as new development projects are proposed. The edits are meant to clarify descriptions and standards in order to more smoothly implement these land uses in the future; they are not significant changes in the intent of any adopted classification. In not approving these clarifications, there will likely be continued ambiguousness or lack of clarity within these classifications that could result in extended review times, staff input or decision-making, and potential frustration or misunderstanding by developers; and
- Change in land use designation for a Focus Area: this proposed change is meant to address flexibility for how and when the Brookhill Shopping Center transitions into the City’s vision for a mixed-use neighborhood and gateway into the City. In not supporting a change, there will be less flexibility for landowners with respect to the extent and type of redevelopment that could be implemented on the site.

The City could also propose alternative solutions to individual suggested changes to the Plan. The impact will likely depend on a few key factors: the significance of the proposed change (whether a word or clarification edit or a major policy change) and consistency with the policies and direction of the adopted Comprehensive Plan.

Background Information

What is the Comprehensive Plan?

The Comprehensive Plan is the City's primary regulatory document for land use and physical development within the City. The document provides cohesive policy direction for all aspects of physical planning in the City, including parks and open space, community design, economic development, transportation and utility infrastructure, and resource management. The goals and policies of the Plan are aligned with the City's Strategic Plan and outline a direction for development, infrastructure improvements and community building over the next 20 or more years.

Although the Comprehensive Plan is a long range planning document, it is also a living document that must be responsive to the surrounding physical, economic and social environment. As a result, updates to the Comprehensive Plan are an essential aspect of maintaining the document's effectiveness as a regulatory document. Cohesive updates to the plan, such as the update completed in 2013, allow the City to analyze all aspects of physical development and planning in the City with in-depth public outreach, economic market research, and evaluation of existing development, demographics, employment and infrastructure needs. These cohesive updates are intensive processes that involve all departments in the city as well as decision makers and the Westminster community. These cohesive updates are envisioned to occur every five to seven years.

More frequent maintenance updates to the Plan are also an important part of ensuring the document is up-to-date and in alignment with changes to the Westminster Municipal Code, adoptions of new open space, and updates to other planning documents for the City, such as the Roadway Master Plan or Water Supply Master Plan. Instituting a schedule for these maintenance updates will ensure the Comprehensive Plan is up-to-date and reflective of changes to the physical environment. As such, an annual maintenance update is proposed, similar to that already established for the City's Zoning Code annual update process.

2013 Cohesive Update to the Comprehensive Land Use Plan

As mentioned above, cohesive updates to the Comprehensive Plan are essential for a regulatory document that is responsive to the community's needs, quality of life and environment. The last cohesive update to the Comprehensive Land Use Plan originally adopted in 1997 was completed in 2004. Over the nine years since the 2004 update, the City, economy and development trends had evolved significantly. Several key factors contributed to the need for a cohesive update to the Plan. These included:

- The City was nearing its physical build-out and little vacant land for development remains. As a result, the majority of new growth in the City would likely be accommodated in redevelopment and infill areas.
- Much of the future development in the City would rely on existing infrastructure and resources, planning for which would need to be closely tied to land uses and development intensity in order to provide adequate services and maintain the City's high quality of life.
- Many of the City's District Centers would benefit from more detailed direction for land use and development intensity to ensure that new development occurs in desired areas and in concert with the City's vision, growth management efforts and infrastructure capacity.
- New or revised land use classifications were needed to address development trends for vertical mixed-use projects, such as buildings with ground floor retail with office or residential uses

above. Likewise, a refined palette of commercial, office and industrial land use classifications will allow the City to better articulate and implement its vision for new development.

Thus, the recently adopted 2013 Comprehensive Plan was a complete revision to the 2004 Comprehensive Land Use Plan with new language, policies, maps and land use classifications. The scope of the Comprehensive Plan was expanded from land use regulation to all aspects of physical planning in the City. The update process was extensive and included several rounds of intensive stakeholder and public outreach as well as economic market and land use analysis.

2014 Maintenance Update to the Comprehensive Plan

As described above, annual updates to the Comprehensive Plan will ensure the document is up-to-date and in line with all other plans in the City. This first annual update provides an opportunity to quickly address the need for clarifying text and descriptions in the Plan, particularly since the document includes new language and planning concepts. In particular, the need for clarification of new land use classifications has been identified as they have begun to be applied to new development proposals. Minor edits and clarifications to these classifications will improve and facilitate the use of these new “tools” in the City’s land use toolbox. Other minor edits have also been identified. The edits and proposed changes to the Comprehensive Plan are discussed below, outlined in **Attachment A** and shown in **Attachment B**.

Text and Spelling Edits

All minor in scope, these edits are sparsely distributed throughout the document; the pages on which they are located are identified in **Attachment A**. These edits include both text and map legend or label edits.

Map and Table Edits

Map edits have been identified primarily for new open space acquisitions. A few other edits include the correct designation of some park spaces as either private or public. Other map edits include improving legibility of the Street Network Plan by adjusting line widths as well as clarifications within legends and additional map labels. Almost all of the maps will be edited to reflect the changes to the open space layer as this layer is part of the base city information provided in most of the maps.

An additional map edit will update the designation of a property from Public/Quasi Public to Office. The property (located at 7396 Lowell Boulevard) was originally designated Public/Quasi Public in the 2004 Comprehensive Land Use Plan, since a church occupied the property from the early 1990’s until approximately 2000. However, the property has been utilized for office uses since 2003. An update of the property’s designation to Office will conform to the uses presently allowed by the zoning for the property and coincide with property located immediately to the south, which is also designated Office.

Land Use Classification Edits

A primary focus of the 2013 Comprehensive Plan update was to address the need for land use classifications that would provide greater direction for the City’s remaining vacant land as well as address changes in development trends and accommodate higher intensity, transit supportive development. The result of the update was the retirement of several existing land use designations (District Center, Business Park and Office/Residential) and the introduction of seven new designations (R-36 Residential, Mixed Use, Mixed Use Center, Service Commercial, Office/R&D Low Intensity, Office/R&D High Intensity, and Flex/Light Industrial). Below, the intent of each land use classification within the Comprehensive Plan is described, along with any proposed changes to better clarify and improve implementation of that classification.

- **R-1 Residential:** Intended for very low density single family residential development. *No change is proposed.*
- **R-2.5 Residential:** Also intended for low density single family residential development. *No change is proposed.*
- **R-3.5 Residential:** Intended for low density single family residential development and potentially duplexes. *No change is proposed.*
- **R-5 Residential:** Intended for low to medium density single family detached and attached residences, duplexes, patio homes and townhomes. *No change is proposed.*
- **R-8 Residential:** Intended for medium density residential development that could include single family attached and detached residences, duplexes, patio homes, townhomes and condominiums. *Staff proposes removing the maximum height of two stories from the Development Standards table, as some townhome typologies with attached or tuck-under garages are greater than two stories and would still be consistent with the intent of the classification.*
- **R-18 Residential:** Intended for medium to high density residential development with a range of multifamily or attached housing product types, from townhomes to apartments. *Staff proposes removing the Site Composition note requiring private recreation facilities in the Development Standards table because the note is redundant to the Multifamily design guidelines.*
- **R-36 Residential:** A new designation as of 2013, intended for higher density residential development near major activity and neighborhood centers, with direct access to shopping, amenities and transit. *Staff proposes removing the Site Composition note requiring private recreation facilities and common space in the Development Standards table because the note is redundant to the Multifamily design guidelines.*
- **Traditional Mixed Use Neighborhood Development (TMUND):** Intended to accommodate a cohesive neighborhood with a range of uses from residential (both single and multifamily) to commercial and office uses. Mixed use, pedestrian-oriented development in a town center configuration with ample parks and amenities is emphasized. *No change is proposed.*
- **Mixed Use:** A new designation as of 2013, intended to incentivize reinvestment and redevelopment in aging commercial shopping and strip centers with high vacancy. The classification allows retail commercial development by right, consistent with the Retail Commercial classification. The classification also allows mixed use development with a combination of residential and commercial uses. The mixed use development must have some portion of the project that is vertically integrated (i.e. retail or commercial use located on the ground floor), with a minimum floor area ratio of 0.1 commercial use (e.g. a one-acre parcel of approximately 40,000 square feet would be required to provide 4,000 square feet of commercial use). Commercial uses within a mixed use redevelopment project would be more regulated with limitations on auto-oriented and drive through uses. There is no requirement for mixed use development on these sites. Landowners may continue to maintain and/or redevelop as a purely retail commercial use. *Staff proposes making several clarifications: (1) instead of prohibiting drive throughs and auto related uses outright from residential mixed-use projects, clarifying that they are “strongly discouraged”; (2) Replacing the limited or potentially prohibited retail commercial uses in the Development Standards table (that limit uses based on surrounding*

context, sensitive adjacent uses, or other issues as identified by the City) with a standard note that is repeated in several other classifications that refers the reader back to the Retail Commercial designation, in order to reduce redundancy and increase clarity of the document; (3) clarify that minimum and maximum residential densities are applicable only “when provided”; (4) eliminate the minimum 0.25 retail commercial FAR, as the number may be too high to achieve due to site constraints; (5) add a note to the limited or potentially limited uses that it is only applicable to mixed-use projects with both residential and commercial uses.

- **Mixed Use Center:** A new designation as of 2013, intended to accommodate and encourage higher intensity mixed-use and commercial development adjacent to major transit stations and activity centers in the City. The classification allows a wide range of uses from commercial and office to hotel and residential uses. Development typologies and uses that do not support a walkable pedestrian environment are limited, with auto-oriented uses and drive throughs not permitted. *Staff proposes making several clarifications: (1) adding in the description that “new standalone uses with” drive throughs are not permitted, suggesting there is flexibility for existing, established drive through uses to remain as part of a redevelopment project; (2) a note to further clarify the latter, that “formerly established drive through uses may be permitted as a component of new development, subject to the development review process”; (3) addition to note 3 that combined floor area ratio includes both residential and commercial building area.*
- **Retail Commercial:** Intended to allow a variety of neighborhood and regional commercial uses with retail, eating establishments, personal and business services and professional offices. Some uses may be limited or potentially prohibited based on location of nearby sensitive residential, public or quasi-public uses. All other designations that permit retail commercial uses reference this classification. *Staff proposes a minor clarifying word edit in the description.*
- **Service Commercial:** This classification is meant to ensure the city continues to offer a range of commercial services to meet the needs of the community. *No change is proposed.*
- **Office:** Intended to accommodate primarily professional and campus style office uses including medical, legal, banking and other similar professional office uses. *Staff proposes several clarifications to the text and Development Standards table: (1) adding that support retail uses are limited to “a portion of the project gross floor area, or GFA”; (2) adding a maximum square footage (10,000 sqft.) to the support commercial into the Development Standards table; (3) adding the common note for potentially limited or prohibited retail commercial uses; and (4) adding a note to clarify that the extent of support commercial uses could be further constrained by parking availability.*
- **Office/R&D Low Intensity:** This classification is intended to accommodate the professional and campus style office uses that would typically have located in the previous Business Park land use classification. An example of this use type is the Westmoor business campus. Some manufacturing, warehousing and production space is also allowed although limited in order to ensure an overall office campus environment is maintained within areas designated with this classification. *Staff proposes a few clarifications within the Development Standards table: (1) clarifying that support commercial and manufacturing, warehouse, and production space permitted is a percent of the project’s gross floor area; (2) adding a maximum of 15,000 sqft. for support commercial use; (3) adding the common note for potentially limited or prohibited retail commercial uses; (4) moving the manufacturing/warehouse/production distribution note to the*

table text for greater visibility; and (5) adding a note to clarify that the extent of support commercial uses could be further constrained by parking availability.

- **Office/R&D High Intensity:** Intended to be a generator for employment, with a high intensity of office uses encouraged with minimum manufacturing, warehouse, and production space. Areas designated as such are strategically located at key intersections along US 36 and I-25. *Staff proposes a few clarifications within the Development Standards table: (1) clarifying that support commercial and manufacturing, warehouse, and production space permitted is a percent of the project's gross floor area; (2) adding a maximum of 15,000 sqft. for support commercial use; (3) adding the common note for potentially limited or prohibited retail commercial uses; (4) moving the manufacturing/warehouse/production distribution note to the table text for greater visibility; and (5) adding a note to clarify that the extent of support commercial uses could be further constrained by parking availability.*
- **Flex/Light Industrial:** Intended to ensure that the City maintains areas for light industrial and flexible office and business incubation space. This classification is applied to many of the formerly designated Business Park areas and ensures that the City maintains spaces for a wide range of light industrial and flex uses. An example of this use type is the Park Centre business area and the southern portion of Avaya. *Staff proposes a few clarifications within the text and Development Standards table: (1) adding within the text that support commercial uses are permitted up to 10% of gross floor area; (2) adding to the Development Standards table that studios are permitted as a support commercial use; (3) clarifying that support commercial use is a percent of the project's gross floor area and adding a maximum permitted building area to any one project; (4) adding the common note for potentially limited or prohibited retail commercial uses; and (5) adding a note to clarify that the extent of support commercial uses could be further constrained by parking availability.*
- **Parks and Open Space** classifications designate city-owned open space, public parks, private parks/private open space, and golf courses. *No change is proposed to any of these classifications.*
- **Major Creek Corridor on Non-Public Land:** Intended to ensure areas in identified 100-year flood plains that are not city-owned are not developed or impacted by development. *Staff proposes to add this classification description to the Comprehensive Plan, as although it is identified currently on the land use map, there is no text description. The text description includes the same intent and similar wording to the 2004 Comprehensive Land Use Plan.*

Brookhill Focus Area

The Brookhill Shopping Center was identified by City Council as a priority area for revitalization and potential redevelopment. The vision for the area was expressed as a higher intensity mixed-use and walkable district that would act as a key gateway into the City. In order to underline the desire for a significant transformation of the site, City Council supported designation of the area as a Comprehensive Plan Focus Area with the Mixed Use Center land use classification. The Mixed Use Center designation encourages a wide range of development and uses, from vertically mixed residential and commercial uses to standalone, higher intensity office and hotel uses. The minimum floor area ratio required by this classification is a 0.75, which would entail multiple story buildings and some structured parking.

Recently, a small portion of the site has been identified for redevelopment of existing retail commercial uses, a project that onto itself would not meet the minimum 0.75 floor area ratio required by the Mixed Use Center classification. Recent discussions with this specific property owner, who purchased the site at

the time of the Comprehensive Plan adoption, but after property owner outreach was conducted, indicated that the site will be improved and maintained as a retail commercial use in the near future. Staff proposes that a more appropriate designation for the Brookhill Focus Area may be Mixed Use. As mentioned above, the intent of the Mixed Use classification is twofold: it allows landowners of retail commercial sites to maintain their retail commercial land use with no modification, while also providing incentive for potential redevelopment to a mixed use project which would allow combined residential and commercial uses. Re-designating the Brookhill Focus Area with Mixed Use would still be consistent with the City's vision and the policies set forth in the Comprehensive Plan.

While a change to the Mixed Use classification would still meet the landowner's current plans for the site, the landowner has expressed a desire to be re-designated as Retail Commercial. The Retail Commercial designation would not consistent with the Comprehensive Plan vision and policies for the area; Staff does not recommend that change.

Next Steps

Based on City Council feedback, the proposed changes to the Comprehensive Plan outlined will be finalized and Staff will return to City Council with an ordinance for adoption of the proposed Comprehensive Plan revisions. Subsequent Comprehensive Plan updates are planned for the first quarter of each consecutive year, starting in 2015.

The Comprehensive Plan update supports all five of the City Council's Strategic Plan goals of Strong, Balanced Local Economy; Safe and Healthy Community; Financially Sustainable City Government Providing Exceptional Services; Vibrant Neighborhoods in One Livable Community; and Beautiful and Environmentally Sensitive City.

Respectfully submitted,

J. Brent McFall
City Manager

Attachments

- Attachment A: Summary of Proposed Changes to 2013 Comprehensive Plan
- Attachment B: Proposed Changes to 2013 Comprehensive Plan

Summary of Proposed Changes to 2013 Comprehensive Plan

<i>Type of Change</i>	<i>Description</i>
<i>Policy or Land Use Designation Change</i>	
Brookhill Shopping Center	Recommend changing use from Mixed Use Center to Mixed Use Property owner sent letter requesting Retail Commercial
	Will need to update land use maps and Focus area discussion and references in document in chapters 2 & 6
7396 Lowell Boulevard	Changing from Public/Quasi Public to Office. "Office" has been an allowed use on the property (7396 Lowell Boulevard) since the approval of the Brundage Business Plaza PDP in 1983. The property was utilized as a church (which is also an allowed use identified in the PDP) from the early '90s until approximately 2000. The property was vacant until 2003, when Wescto Systems, an HVAC mechanical contractor, located their main office at the site.
<i>Text Changes/Clarifications</i>	
1-3	Adding a clarification about the website and where background documents can be found. Also adding that a neighborhood meeting was held for the South Westminster area (this was held after the draft was submitted).
2-4	Adding St. Anthony's project to list of current development
2-8	Adding: "Similar to residential densities, maximum FARs may not be achievable due to site constraints."
2-16	Removing max height from R-8
2-17	Removing site composition requirement from R-18
2-18	Removing site composition requirement from R-36
2-20	Adding a note for auto-oriented uses and drive thoughts that they are: "Not permitted as part of a mixed-use residential and commercial project."
	Removing 0.25 minimum FAR
	Replacing list of limited/potentially limited retail uses with note: "Specific retail commercial uses may be limited or prohibited depending on their proximity to residential, public or quasi-public uses or for other reasons as determined by the city. See the Retail Commercial designation for a list of Limited or Potentially Prohibited Uses."
2-22	Adding "commercial" after "neighborhood and regional" in description
2-23	Removing site characteristics
2-24	Clarifying limitations are for GFA and added a limit of 10,000 sqft Added retail commercial limitation note
2-25	Clarifying limitations are for GFA and added a limit of 15,000 sqft adding "warehouse" to description of limited use to be consistent with description Added retail commercial limitation note
2-26	Clarifying limitations are for GFA and added a limit of 15,000 sqft Adding "warehouse" to description of limited use to be consistent with description Added retail commercial limitation note
2-27	same as above, also added text re: allowance of supporting retail to description.

2-29	Added Major Creek Corridor on Non Public Land classification
2-39	Clarifying what areas are in Jefferson versus Adams counties
3-10 and 3-11	Update images
5-3	Clarifying that the Comprehensive Roadway Plan is depicted on the map, adjusting text to be more in line with the map, adding a figure reference/explanation.
7-5, 7-11, 7-12	Updating open space numbers in text and tables
<i>Drawing Edits</i>	
1-2	Add Unincorporated JeffCo labels to map
2-1	Updating parks/open space changes and potentially Brookhill; and areas of major creek corridors (reducing and adding)
2-3	Fix labels on map
5-1	Changes to reflect correct Comprehensive Roadway Plan. Fixing legend to provide greater clarity. Making the image more graphically legible.
7-3	Update with corrected parks/private parks and open space acquisitions
<i>Appendix C maps</i>	
Updated to match 2-1 Land Use Diagram	
<i>Minor Edits/Misspellings</i>	
Table of Contents	
1-3	
1-4	
1-5	Add a caption for City evolution image
1-10	
1-13	
1-21	
2-2	Changing designations to classifications (multiple pages)
2-3	
2-32	
2-33	
2-41	
2-43	
3-15	
5-8	
5-9	
5-13	
5-14	
6-2	
6-5	
6-6	
6-23	Changing out image



- Many areas in the city that were formerly designated as District Centers in the 2004 CLUP require more detailed direction for land use and development intensity to ensure that new development occurs in desired areas and in concert with the city's vision, growth management efforts and infrastructure capacity.
- Finally, the need to accommodate mixed-use and transit-supportive development, ensure development continuity in commercial and employment centers, and preserve land for services and light industry requires a more refined palette of land use classifications.

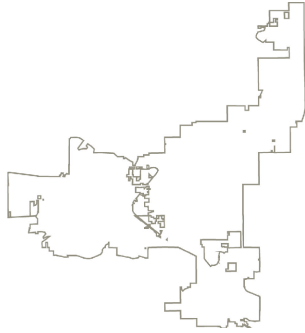
These factors require alignment of all physical planning efforts in the city in order to ensure a high quality of life, as well as fiscal and economic sustainability for the city. As a result, the original scope of the CLUP document has been expanded to provide an equal focus on all planning within the city, including land use, economic development, transportation, community design, parks, recreation, libraries and open space, and public utilities and services. The name of the CLUP has also changed to the Comprehensive Plan since the focus of this document has expanded beyond land use matters.

Plan Process

Input from city officials as well as community stakeholders, city and regional agencies, and the overall Westminster community was a key element of the planning process. The Plan update process was initiated in October of 2012, with introduction of a more inclusive planning approach presented to City Council and Planning Commission. Stakeholder and agency interviews followed, which included Westminster property and business owners, representatives from neighboring jurisdictions, school districts and many others, with the intent of understanding ~~of~~ key issues, opportunities and challenges that would influence policy direction ~~in of~~ the Plan. Upon completion of a citywide concept plan, a community-wide workshop was held in July 2013 at City Park Recreation Center and online via WestyConnect, the city's interactive communication portal for all aspects of city life and planning. ~~Additional neighborhood meetings in South Westminster were held during the public review period of the draft plan.~~

~~In addition to stakeholder and community outreach,~~ direct involvement with city officials was ~~also~~ an essential element of the planning process. At each major milestone of plan development, City Council and Planning Commission provided input and direction. All documents, presentations and analysis produced during the planning process, including presentations to the Council, were posted on the city's ~~website: www.cityofwestminster.us under the "Documents and Presentations" section.~~ Comprehensive Plan project website.





City Boundary

1.2 REGIONAL LOCATION AND CONTEXT

Regional Location and Planning Boundaries

The City of Westminster is centrally located between the cities of Boulder and Denver, in the northwest quadrant of the Denver Metropolitan (Denver Metro) area. The city is bordered by the City and County of Broomfield to the north and west, unincorporated Jefferson County to the west, the cities of Thornton, Northglenn and Federal Heights to the east, unincorporated Adams County to the southeast and the City of Arvada to the southwest. The western portion of the city directly abuts the Rocky Flats National Wildlife Refuge in Jefferson County. Two major highways traverse the city—US Highway 36 (US 36), connecting the city northwest to Boulder and the mountains, and Interstate 25 (I-25), running between Denver and Fort Collins. The city’s regional location is shown in Figure 1-1.

The city’s land area is expansive, encompassing 33.8 square miles. The planning boundary of this Comprehensive Plan coincides with the outer extent of the existing city limits, with the exception of a few areas at the southwest and southeast portions of the city in unincorporated Jefferson and Adams counties, respectively (see Chapter 2: Land Use for additional discussion of unincorporated areas).

Physical Context

City Evolution

Incorporated in 1911, Westminster began as a small community centered on the commercial district in the vicinity of 73rd Avenue and Bradburn Boulevard. The city remained relatively small until the post World War II era. Since 1950, the population has grown from 1,686 to approximately 108,000 persons ~~at the~~ by 2010 (U.S. Census). During that same period the city’s land area increased from 4.5 square miles to almost 34 square miles, resulting from the annexation of large tracts of vacant lands to the north and west. This expansion was facilitated in part by the purchase of water resource rights that provided the city with greater capacity for development. Today, Westminster is an expansive city that is located within two counties, Adams and Jefferson, as well as three separate school districts.

Physical Influences

Natural features of the Front Range landscape have influenced land use patterns and growth of the city. The city’s gently rolling hills are interspersed with several creek corridors including Little Dry Creek, Walnut Creek and Big Dry Creek and its tributaries. Associated floodplains and wetlands areas provide important wildlife habitat. The majority of this sensitive habitat area



73rd Avenue is the historic core of Westminster. Improvements over the years have been focused on streetscape and facade improvements to ensure the area serves as a community destination for years to come.



is a part of the city’s open space network, which comprises over 3,000 acres of land. Additional sensitive habitat area is located within the city’s 2,919 acres of park land and 644 acres of public golf courses.

Additional physical features that have impacted the pattern and extent of development in the city include the city’s topography and major transportation infrastructure. Although the topography of the city is generally level, there are areas with steep slopes that exceed 15 percent grade. These areas include land north of 120th Avenue and south of 84th Avenue near Lowell and Federal boulevards. Although development is limited by the slopes, it is enhanced by the views to the mountains and downtown Denver, respectively. Development is also influenced by the presence of the Rocky Mountain Metropolitan Airport. Noise-related impacts and critical zones can impact development adjacent to the airport. The associated Airport Influence Area and critical zones are indicated on Figure 1-2.

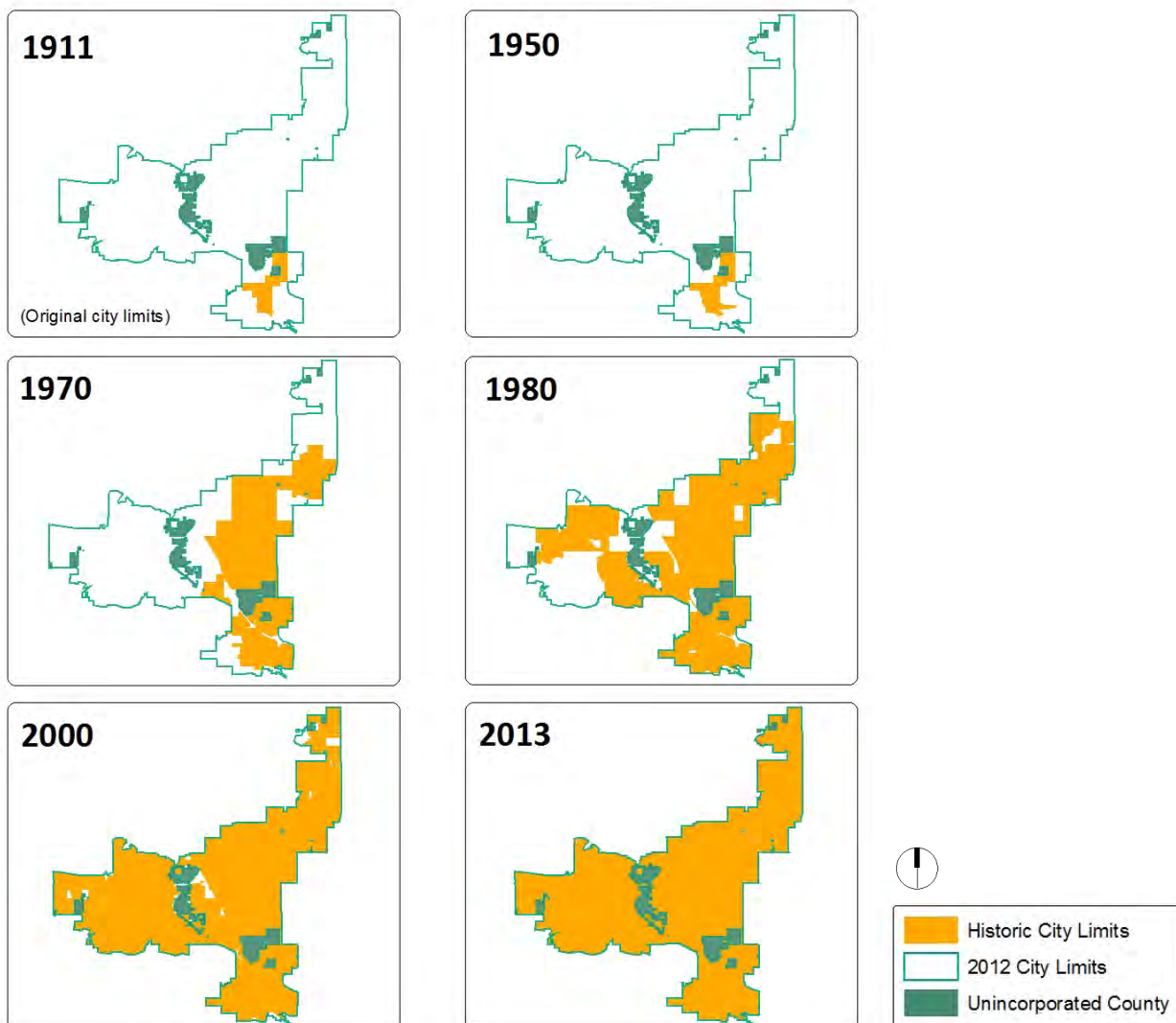
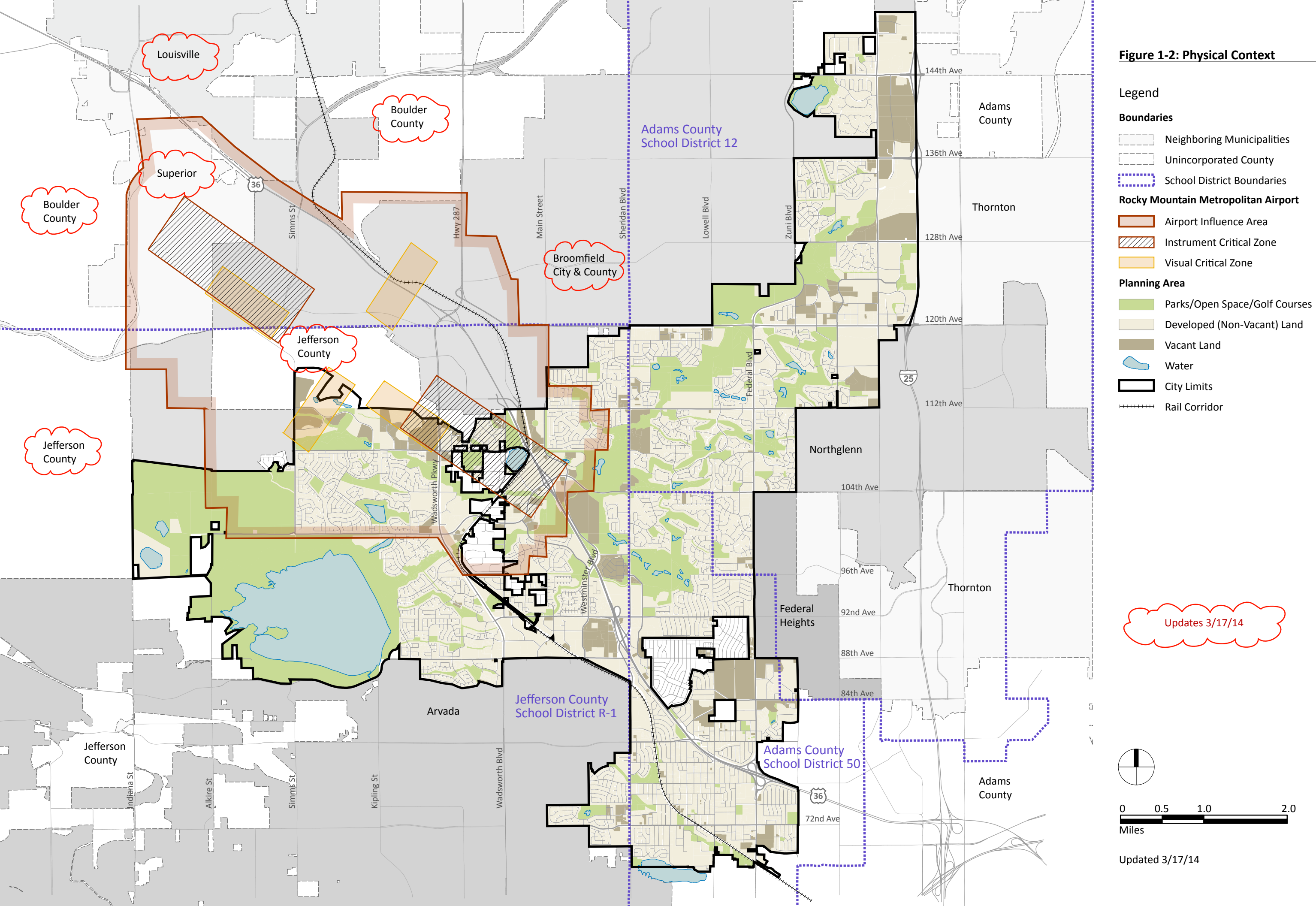


Figure 1-2: Physical Context



Legend

Boundaries

- Neighboring Municipalities
- Unincorporated County
- School District Boundaries

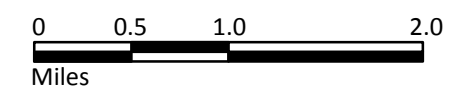
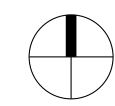
Rocky Mountain Metropolitan Airport

- Airport Influence Area
- Instrument Critical Zone
- Visual Critical Zone

Planning Area

- Parks/Open Space/Golf Courses
- Developed (Non-Vacant) Land
- Vacant Land
- Water
- City Limits
- Rail Corridor

Updates 3/17/14



Updated 3/17/14

Jefferson County Comprehensive Plan

The western portion of Westminster, west of Sheridan Boulevard, is located within Jefferson County. Jefferson County comprises the western edge of the Denver metropolitan region, with Westminster located at its northeastern edge. The County recently completed an update to its Comprehensive Master Plan in late 2012. The Master Plan is comprised of multiple area plans and comprehensive development plans that guide land use and physical planning throughout the county. Westminster is located within the North Plains Area Plan, which provides direction for unincorporated land surrounded by the city, much of which is located in enclaves along the Wadsworth Boulevard corridor. The North Plains Area Plan designates the majority of enclave area south of Church Ranch Boulevard as low density single family (one-acre-plus lot) development. The northern enclaves west of the BNSF rail corridor are primarily low-intensity development that accommodates Airport Critical Zone limitations on population density for the Rocky Mountain Metropolitan Airport Critical Zone. These uses include one-acre-lot plus single family residential uses, open space and recreation, and commercial, industrial and agricultural uses. The enclave to the east of the rail corridor is designated as mixed-use commercial, which could accommodate retail, office and mixed-use retail/residential uses. For further information see Appendix A: North Plains Area Plan.



The Westminster Station, at approximately 70th Avenue and Irving Street, will open in 2016. The station and adjoining plazas parks and development will create a new transit-oriented destination and district in the city.

US 36 Corridor

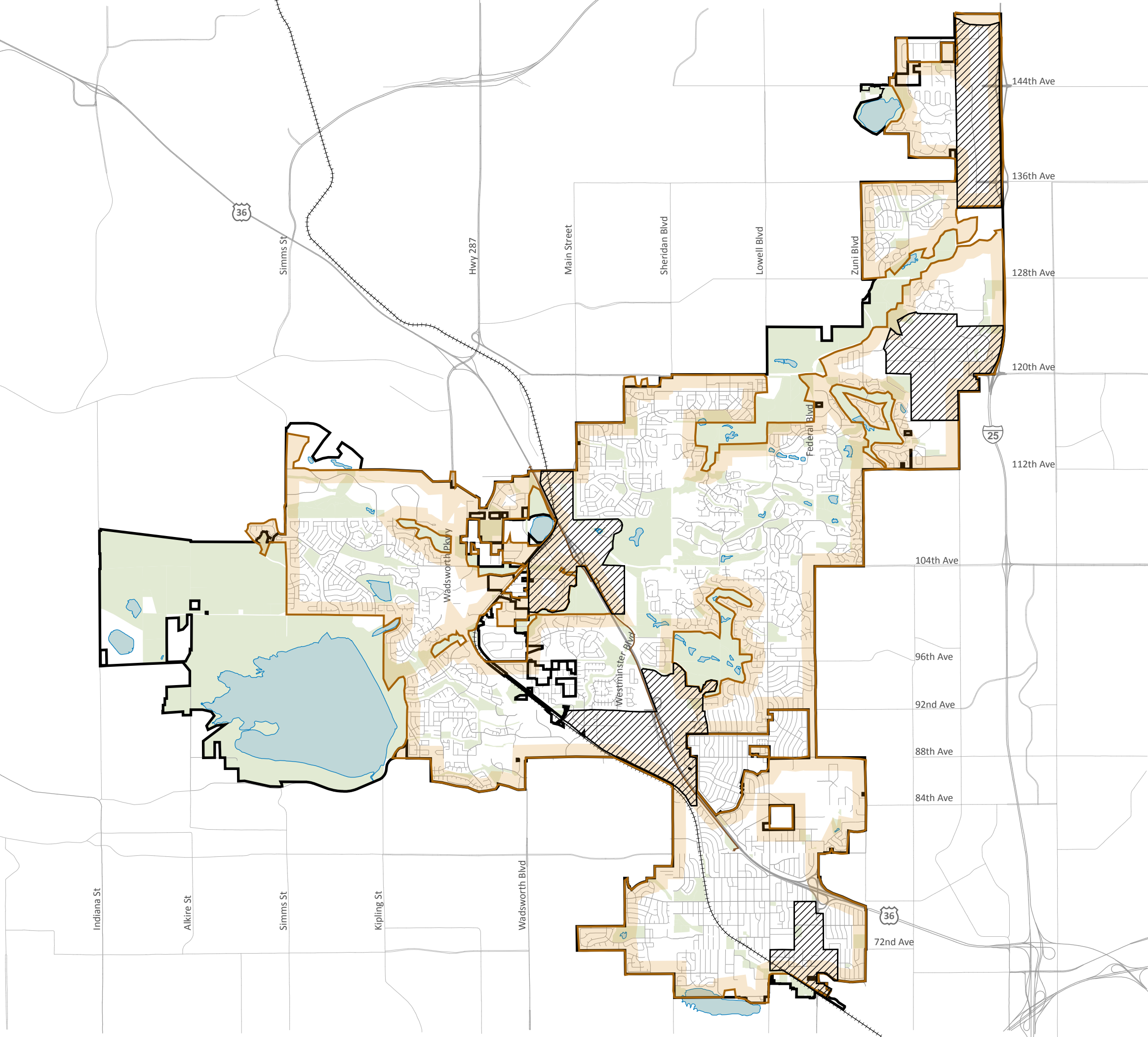
As a component of the voter-approved 2004 FasTracks program, the Northwest Corridor improvements along US 36 include a commuter rail line from Denver's Union Station to Boulder and Longmont; enhanced bus service (Bus Rapid Transit or BRT), which will include local and regional bus service improvements to stations, routes and vehicles; bus ramp by-pass lanes at every interchange west of Federal Boulevard; and a managed toll/high occupancy vehicle/bus lane west of Pecos Street to Table Mesa in Boulder. This will connect with the existing I-25 High Occupancy Vehicle/High Occupancy Toll lanes east of Pecos Street. These improvements will provide improved multimodal transportation options between Boulder and Denver, and will benefit existing development and enhance future development opportunities in Westminster particularly, around the Westminster Center and Church Ranch park-and-rides.

The City of Westminster strongly supports commuter rail transit through the city in the relative near term (phased approach) and eventual completion of the line to at least Boulder as funding/financing becomes available. Three stations along the FasTracks Northwest Corridor commuter rail line are located in the city at Westminster Station near 70th Avenue and Irving Street, downtown Westminster at 88th Avenue and Harlan Street, and

Figure 1-3: Growth Management

Legend

-  DRCOG 2011 Urban Growth Boundary
-  DRCOG Urban Centers
-  Parks/Open Space/Golf Courses
-  Water
-  City Limits
-  Rail Corridor





Church Ranch just north of the Shops at Walnut Creek. Westminster Station is funded as part of RTD's Eagle P3 project and will be an end-of-line station until funding/financing becomes available for the remainder of the Northwest rail corridor. Commuter rail service to this station is anticipated to begin in 2016. The City of Westminster will continue to aggressively pursue efforts to extend the commuter rail line through downtown Westminster and Church Ranch.

The improvements to the US 36 Corridor (commuter rail and BRT) will be refined and prioritized upon completion of the Northwest Area Mobility Study (NAMS). The study's goal is to develop consensus between RTD, CDOT, corridor stakeholders and local jurisdictions on short and long-term transit improvements in the corridor. Specific timing for completion of these improvements will be based on priorities identified by NAMS, which will be finalized in early 2014.

Rocky Mountain Metropolitan Airport and Master Plan

The Rocky Mountain Metropolitan Airport is located in Jefferson County just northwest of Westminster's city limits, between Simms Street and Wadsworth Parkway. Jefferson County owns and operates the airport, and recently completed an update to the airport's master plan in 2011. The master plan is an advisory document for local municipal jurisdictions within the Airport Influence Area. The master plan provides projections for airport operations and development on airport-owned land as well as land use guidance for lands within its Airport Influence Area, and most importantly, within its Instrument Critical Zone. The City of Westminster will continue to work with Jefferson County as land use decisions are made for property within the Instrument Critical Zone (see Figure 1-2).

The airport's master plan projects an annual 1.8 percent increase of airport operations through 2030. The increased activity will be coupled with slightly larger aircraft utilizing the airport. With this increased activity, the master plan proposes approximately 180-220 acres of development of airport-related commercial and industrial uses to the southwest of the existing runways. The master plan also identifies the need for an expanded terminal, airport operation facilities and improved circulation with a redirection of Simms Street and an extension of Jefferson Parkway along the northwest portion of the airport.



1.4 PLAN ORGANIZATION

The Comprehensive Plan is organized into the following chapters:

- *Introduction:* This includes the purpose and overall planning context for the plan as well as the guiding principles that provide the framework for the goals and policies in the following chapters.
- *Land Use:* This chapter provides the physical framework for development in the city through designation and definition of land use **standards classifications** and policies for development and land use.
- *Focus Areas:* This chapter describes the city's vision for key areas in the city, and includes specific goals and policies that will guide future planning and development in these areas.
- *Economic Vitality:* This chapter establishes policies to promote economic expansion and growth in the city while retaining a stable fiscal base.
- *Transportation and Circulation:* This chapter includes direction for all modes of travel in the city, ensuring that vehicle, bicycle, pedestrian and transit movement is balanced **and coordinated**.
- *City Identity Design:* This chapter provides guidance on all aspects of the built form in the city, from development to streetscapes, public art and historic preservation.
- *Parks, Recreation, Libraries and Open Space:* This chapter outlines the framework for provision, maintenance and creation of parks, recreational facilities and open space in the city.
- *Public Facilities and Utilities:* This chapter outlines policies that will ensure that growth is in step with provision and availability of city utilities, infrastructure systems and public services.
- *Plan Compliance:* This chapter delineates the applicability and implementation of the Comprehensive Plan.



Ensuring the city has a wide range of complementary and supportive uses will provide the community's residents and businesses with a sustainable, high quality living environment.

Overview

This update to the Comprehensive Plan represents a significant shift in planning paradigm from lateral growth with maximized flexibility to strategic growth on remaining vacant land and redevelopment areas. This development pattern will result in a more efficient use of land, supporting more regionally sustainable land use patterns. The Plan provides the framework for mixed-use development within the city that is conveniently accessed by all modes of transportation. Emphasis is placed on providing transit-supportive commercial, office and residential uses close to rail and major bus transit stations. Higher overall development intensity in these areas will be encouraged as well in order to maximize synergy of uses, access to key services and day and evening populations.

The Plan also recognizes the need to identify land for employment growth in the city, particularly along US 36 and I-25, taking advantage of visibility and convenient access from these corridors. This focus on employment will ensure that the city's economic environment continues to be balanced and that businesses in the community continue to meet resident and business demand for services. The Plan designates land area for a range of employment uses, including essential service commercial and light industrial uses.

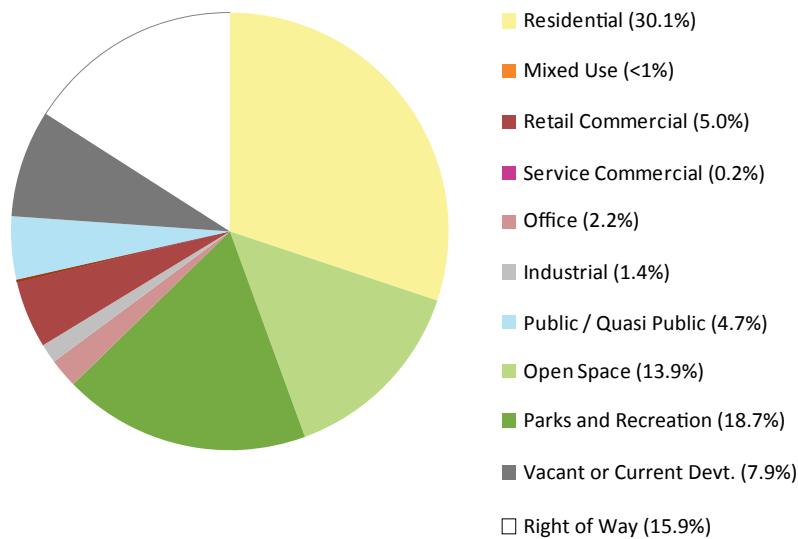
The Plan's land use framework is supported by modification of the city's land use "toolkit", or land use ~~designations~~ **classifications**. Seven new land use ~~designations~~ **classifications** are added or modified (and three existing ~~designations~~ **classifications** are retired from the 2004 CLUP including District Center, Business Park and Office/Residential). The new land use designations provide opportunity for higher density residential development and mixed use development (both standalone and transit-oriented), create greater specificity and direction for employment uses, and help preserve opportunity for service commercial and light industrial uses.

2.1 EXISTING LAND USE CONTEXT

Westminster is a distinctive community along the Front Range, where open space, parks and recreational amenities are a prominent feature of the city’s physical landscape. The city’s land use pattern is generally influenced by major regional transportation corridors. For the most part, retail, hotel and employment uses are clustered along I-25 and US 36 around major interchanges. Outside of these corridors, uses are primarily residential, with parks and open spaces integrated throughout. Smaller- and medium-scale commercial uses are located along arterial streets in the city, like Wadsworth Parkway, 120th Avenue, Sheridan Boulevard, Federal Boulevard and 72nd Avenue. South of 80th Avenue, in the oldest portion of the city, the use pattern is more diverse, particularly south of 72nd Avenue where commercial and light industrial uses are focused. As a whole, however, the city maintains a diverse array of uses, as shown in Figure 2-1. Chart 2-1 provides a breakdown of use by land area.



Chart 2-1: 2013 Existing Distribution of Land Area in the City



Existing development in the city includes almost 19,000,000 square feet of non-residential building space and almost 45,000 dwelling units. Balancing this development is approximately 6,500 acres of parks, open space and golf courses.

Existing Pattern

Of the total land area in the city, open space, parks, golf courses and conservation areas comprise over 31 percent—more than any other land use in the city. Private parks and open space comprise another 1.4 percent. These areas are interspersed throughout the city, creating multiple continuous natural and creek corridors that traverse the entire city. As illustrated in Chart 2-1, a similar proportion of land is residential, accounting for another 30 percent of land area. Commercial retail and service uses occupy 5.2 percent of the land area, with the remaining land area comprised of 4.7 percent of



Trimble brings both new employment and additional energy into the Westmoor Corporate Park.



Arbour Square adds an active residential population to the Orchard Town Center.



Hyland Village is a new TMUND community with development currently underway.



Country Club Village is an example of recent development that includes both retail and office uses.

public/quasi-public uses, 2.2 percent office, and 1.4 percent industrial. In total, almost 16,500 acres of land are in use within the city (including parks, open space and golf course lands), with another 1,700 acres of vacant platted or unplatted land and 3,450 acres occupied by rights-of-way. The majority of vacant land is located along major corridors like US 36, Wadsworth Parkway and I-25.

Current Development

Development that is currently (as of August 2013) under construction, approved or under review comprises approximately 520 acres in the city with 2,477 planned new dwelling units and 1.0 million square feet of non-residential space. The most significant projects underway include a mixed-use redevelopment of the Westminster Promenade West site, reuse of the 1,000,000-square-foot former Avaya industrial space at 120th Avenue and Huron Street, **the 350,000-square-foot St. Anthony's Hospital in the North I-25 area**, and a new 72-acre Hyland Village traditional mixed-use neighborhood at 96th Avenue and Sheridan Boulevard. Other significant projects include several multifamily apartment projects ranging from 12 to over 400 dwelling units per project.

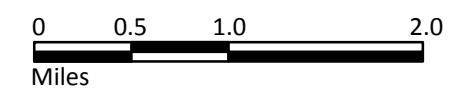
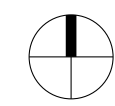
Likewise, recently completed development in the city includes several large projects, ranging from employment uses to multifamily residential developments. The recently-completed Trimble office building at the Westmoor Corporate Park adds almost 400 new employees to the city. The McWhinney Arbour Square project at 148th Avenue and Orchard Parkway was also recently completed, which added 384 new high quality townhome and multifamily units into the Orchard Town Center area. Current development projects in the city are summarized in Appendix B.

Figure 2-1: Existing Land Use 2013

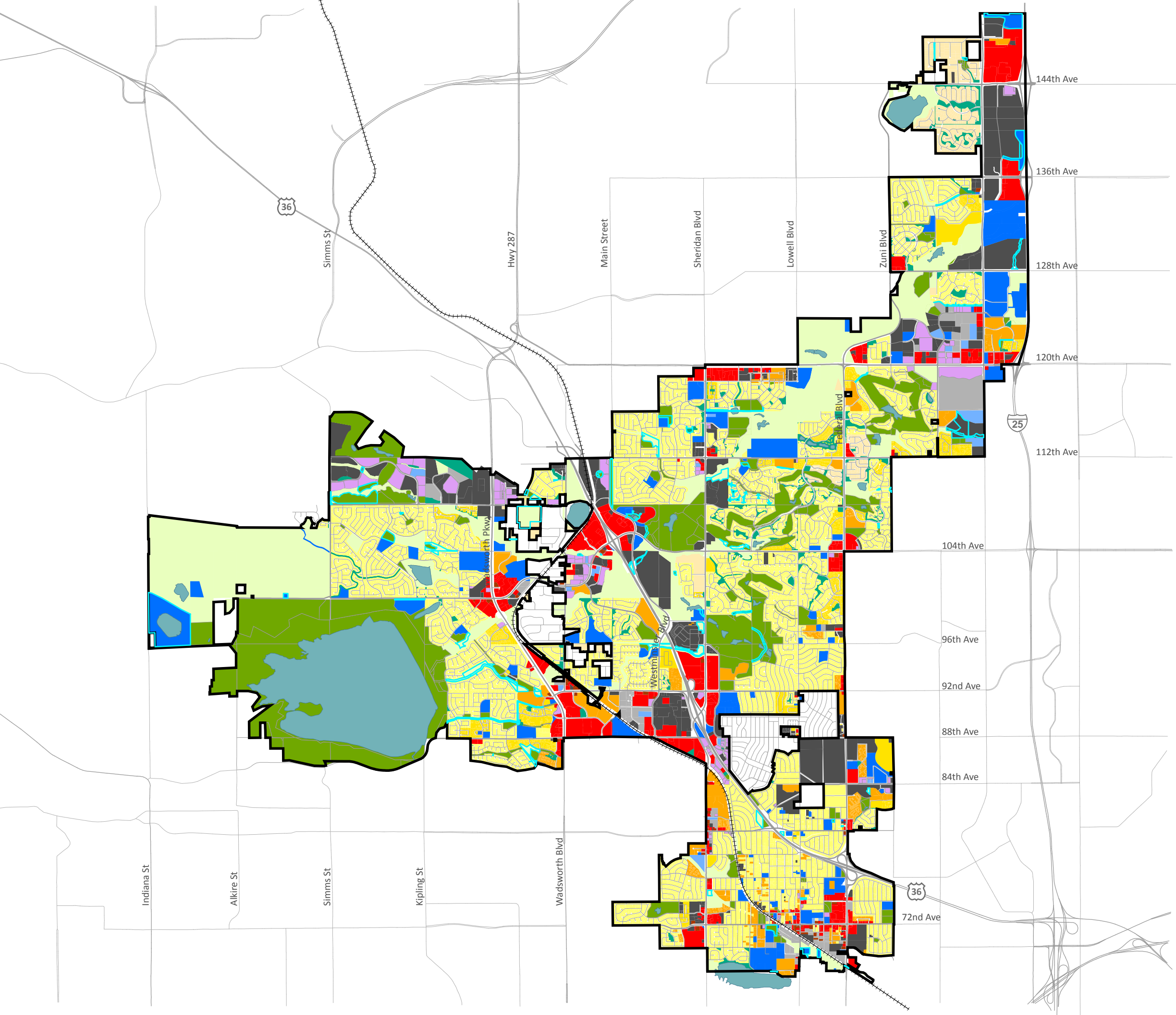
Legend

- Very Low Density Residential (R-1, R-2.5)
- Low Density Residential (R-3.5)
- Medium Density Residential (R-5, R-8)
- High Density Residential (R-18)
- Retail Commercial
- Office
- Light Industrial
- Park and Golf Courses
- Private Park/Private Open Space
- City Owned Open Space
- Public/Quasi Public
- Vacant
- City Limits
- Rail Corridor

Updates 3/17/14



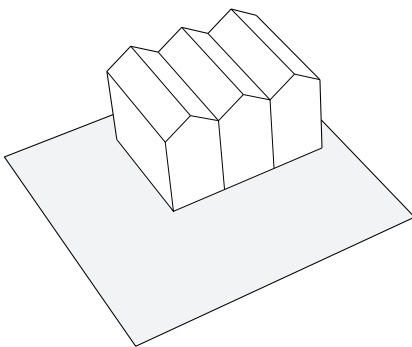
Updated 3/17/14



Density and Intensity

The Comprehensive Plan establishes density and intensity standards for each type of land use. Residential densities are expressed as dwelling units per gross acre, including land for public streets, storm drainage and other rights of way or dedications. This does not include land located within a designated 100-year flood plain (**designated as Major Creek Corridor on Non-Public Land**). It should be noted that maximum density may not be achievable on all sites due to specific site constraints such as topography, drainage patterns, floodplains, wetlands, required rights-of-way, the city’s adopted design guidelines, public land dedication, or other public improvements. Thus, the maximum density listed for each category is not “guaranteed.” The permitted density will be determined during the development review process taking into consideration the above constraints and enforcing the city’s residential design guidelines for each residential type.

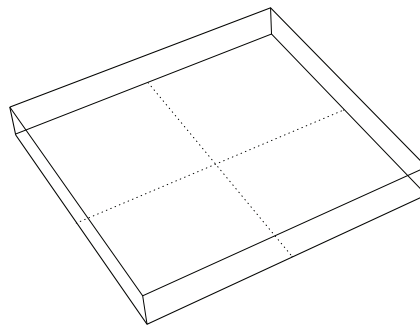
A maximum permitted floor area ratio (FAR) is specified for mixed use and non-residential uses. FAR expresses the ratio of total building square footage to land square footage. For example, an FAR of 2.0 means that for every square foot of land, a developer may build two square feet of building space. Where an FAR is specified for mixed use classifications, the FAR applies to both residential and non-residential building space, excluding structured or surface parking. **Similar to residential densities, maximum FARs may not be achievable due to site constraints.**



Density

Number of dwelling units per one acre.

Densities are calculated over the gross total area of a site, before dedications for streets, open space, drainage or other dedications are made. Shown above, 3.0 units/acre.



Floor Area Ratio (FAR)

Total building area over total site area.

FAR is calculated by dividing the total building area by the total site area. Building area does not include structured parking area. The images both show an FAR of 1.0.

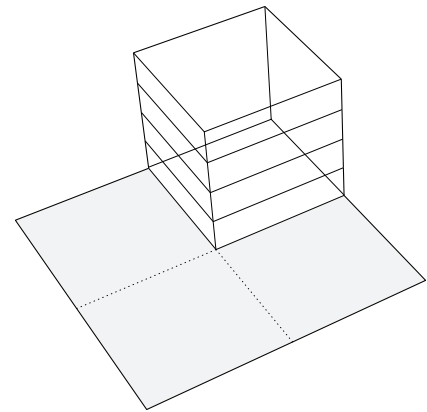
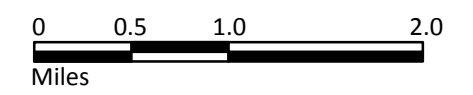
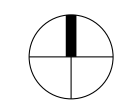


Figure 2-2: Land Use Diagram

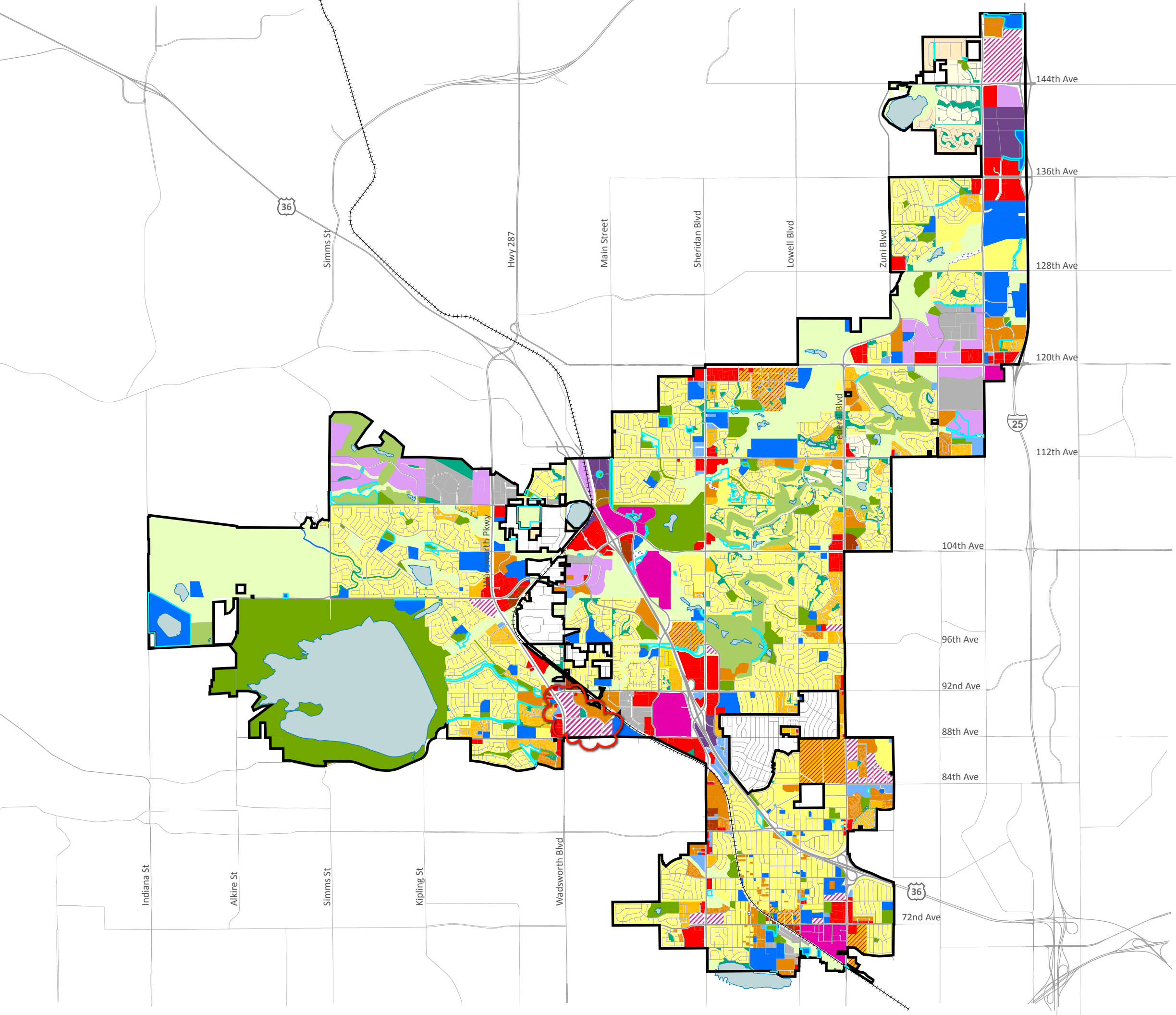
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-  Residential R-1
-  Residential R-2.5
-  Residential R-3.5
-  Residential R-5
-  Residential R-8
-  Residential R-18
-  Residential R-36
-  Traditional Mixed Use Neighborhood Devt.
-  Mixed Use
-  Mixed Use Center
-  Retail Commercial
-  Service Commercial
-  Office
-  Office/R&D Low Intensity
-  Office/R&D High Intensity
-  Flex/Light Industrial
-  Public/Quasi-Public
-  Public Parks
-  City Owned Open Space
-  Golf Courses
-  Private Parks/Open Space
-  Major Creek Corridor on Non-Public Land
-  City Limits
-  Water

 Updates 3/17/14



Updated 3/17/14





Land Use Classification

Land use designations are the tools used to define the city's vision and intent for development throughout the city. They provide overarching direction for land use on a specific site. For the majority of the city's land area, more specific uses are delineated on a property's approved Planned Unit Development (PUD), which must be consistent with the property's Comprehensive Plan land use designation. For properties that are straight zoned (such as Commercial C-1, Business B-1, etc.), the Municipal Code provides greater detail on specific uses permitted within each zoning district. In order to develop, all properties, whether zoned by PUD or individual zoning district, must be developed in accordance with the Comprehensive Plan.

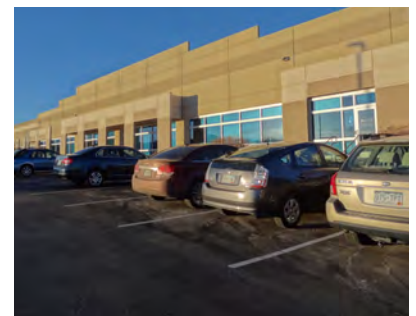
In addition to the uses described in each ~~designation below~~ **classification to follow**, public/quasi public uses—including government offices, police and fire stations, public schools and places of assembly—are permitted in all land use classifications except for park and open space ~~designations~~ **classifications**, subject to conditional use approval.



New high density residential and mixed use categories create opportunity for transit-supportive development and vibrant, mixed-use districts.



New office development categories create opportunity for higher intensities of employment development in key areas in the city.



Service, flex and light industrial uses are designated throughout the city in areas of greatest compatibility and synergy.

R-8 Residential

Up to 8.0 Dwelling Units per Acre



This designation accommodates a mix of housing types from single family residences (attached and detached) and duplexes to townhomes, condominiums and walk-up apartments. This designation is appropriate in close proximity to activity centers and to areas that can be served by transit.

Development Standards	
	<i>Requirement</i>
Land Use	
Primary Uses	Single Family Detached Residences Single Family Attached Residences Duplexes Patio Homes Townhomes Condominiums, and similar
Secondary Uses	Non-commercial Recreational Uses Senior Housing Facilities (1)
Development Characteristics	
Density	Maximum 8.0 du/acre
Maximum Height	Two stories
<i>(1) For facilities with beds rather than dwelling units, 2.5 beds shall equal one dwelling unit for purposes of calculating density.</i>	



R-18 Residential

Up to 18.0 Dwelling Units per Acre



This designation accommodates a mix of higher density housing types including townhomes, apartments and condominiums. R-18 Residential shall be located along arterial streets, near transit centers or available transit, and within or near activity centers with a mix of supportive uses.

Development Standards	
	<i>Requirement</i>
Land Use	
Primary Uses	Apartments Condominiums Townhomes, and similar Single Family Residences
Secondary Uses	Non-commercial Recreational uses Senior Housing Facilities (1)
Development Characteristics	
Density	Maximum 18.0 du/acre
Site Composition	Shall include private recreational facilities
<i>(1) For facilities with beds rather than dwelling units, 2.5 beds shall equal one dwelling unit for purposes of calculating density.</i>	

R-36 Residential

18.0 to 36.0 Dwelling Units per Acre



This designation accommodates a range of higher density housing types from townhomes to apartments, condominiums and similar higher density typologies. R-36 Residential shall be located along arterial streets near transit and activity centers, where supportive neighborhood-serving uses and transit are within a 5- to 10-minute, or half-mile, walk.

Development Standards

Requirement

Land Use

Primary Uses	Apartments, Condominiums, Lofts and Townhomes
Secondary Uses	Non-commercial Recreational uses Senior Housing Facilities (1)

Development Characteristics

Density	Minimum 18.0 du/acre Maximum 36.0 du/acre
---------	--

Site Composition	Shall include private recreational facilities and common space
-------------------------	--

(1) For facilities with beds rather than dwelling units, 2.5 beds shall equal one dwelling unit for purposes of calculating density.



Traditional Mixed Use Neighborhood Development (TMUND) Up to 18.0 Dwelling Units per Acre and 1.0 Commercial FAR



This designation is intended for inclusive neighborhoods with a mix of residential and supportive non-residential uses in a walkable, pedestrian-oriented, urban village development pattern. Housing types could range from medium and small-lot single family homes to multifamily apartments and lofts. Mixed or non-residential uses could include offices, personal/business services, retail and live/work development. An interconnected grid of streets, pedestrian connections and parks is emphasized. The maximum density and intensity for this designation may be applied to the entire TMUND master planned development as opposed to specific sites.

All new development shall be consistent with the TMUND Design Guidelines, which provide greater detail for site, building and landscape design. (Bradburn Village is an example of a successful TMUND project.)

Development Standards

Requirement

Land Use

Primary Uses	Apartments, Condominiums, Lofts and Townhomes Single Family Residences (attached or detached) Offices, Personal Services, Retail Commercial, Live/Work
Secondary Uses	Senior Housing Facilities (1), Child Care
Limited or Potentially Prohibited Uses (2)	Pawn shops, car sales, massage parlors, tattoo parlors, video and other arcades, night clubs, off-track betting, auction houses, thrift stores, used merchandise sales, billiard parlors, gun shops, adult businesses, check cashing offices and day labor services

Development Characteristics

Density	Maximum 18.0 du/acre (3)
Floor Area Ratio	Maximum 1.0 for Commercial uses

- (1) For facilities with beds rather than dwelling units, 2.5 beds shall equal one dwelling unit for purposes of calculating density.
- (2) Uses may be limited or prohibited depending on their proximity to residential, public, or quasi-public uses or for other reasons as determined by the city.
- (3) Greater densities may be allowed if approved by the Planning Commission and City Council.

Mixed Use

8.0 to 36.0 Dwelling Units per Acre and Maximum Combined FAR of 1.5



This designation is intended to foster development with a mix of residential and commercial uses. Stand-alone commercial use or a combination of residential and commercial use is permitted. Where residential development is proposed, a vertical mix of uses (such as residential or office use above ground floor retail) is required with a minimum 0.10 FAR of commercial use (retail, offices or personal/business services). Parking should be located behind buildings, below grade or in structures to ensure active uses face onto public streets. Auto-oriented uses and drive-throughs are **strongly discouraged** as part of residential mixed-use projects.

Development Standards

	<i>Requirement</i>
Land Use	
Primary Uses	Townhomes, Apartments, Condominiums and Lofts Offices, Personal Services, Retail Commercial (1), Live/Work (1)
Limited or Potentially Prohibited Uses (2)	Pawn shops, car sales, massage parlors, tattoo parlors, video and other arcades, night clubs, off-track betting, auction houses, thrift stores, used merchandise sales, billiard parlors, gun shops, adult businesses, check-cashing offices and day labor services
	Auto-oriented uses Stand-alone uses with vehicle drive-throughs
Development Characteristics	
Density	Minimum 8.0 du/acre, when provided Maximum 36.0 du/acre, when provided
Floor Area Ratio	Minimum 0.25 for Standalone Commercial Minimum 0.10 Commercial when Residential is provided Maximum 1.5 Combined Residential and Commercial

(1) Specific Retail Commercial uses may be limited or prohibited depending on their proximity to residential, public, or quasi-public uses or for other reasons as determined by the city. See the Retail Commercial designation for a list of Limited or Potentially Prohibited Uses.

(2) Applicable to mixed-use projects with both residential and commercial uses.



Mixed Use Center

Minimum FAR of 0.75 and Maximum Combined FAR of 2.0*



This designation establishes key activity centers in the city, typically to be located with access to transit. Uses may include a mix of residential, retail, office and hotel uses. Along pedestrian-oriented street frontages, ground floor uses should be active, such as retail stores, restaurants and cafes. A vertical mix of uses is encouraged with retail at the ground level and office, hotel and/or residential on upper floors. Parking is strongly encouraged to be structured or below grade, with minimal surface parking—which should be located away from public view. Auto-oriented uses and **new standalone uses with** drive-throughs are not permitted.

Development Standards

Requirement

Land Use

Primary Uses	Townhomes, Apartments, Condominiums and Lofts Offices, Personal Services, Retail Commercial (1), Live/Work (1)
Prohibited Uses	Auto-oriented uses Stand-alone uses with vehicle drive-throughs (2)

Development Characteristics

Density	Minimum 18.0 du/acre, when provided
Floor Area Ratio	Minimum 0.75 Combined Residential and Commercial (3)(4) Maximum 2.0 Combined Residential and Commercial (3)(4)(5)

(1) Specific Retail Commercial uses may be limited or prohibited depending on their proximity to residential, public, or quasi-public uses or for other reasons as determined by the city. See the Retail Commercial designation for a list of Limited or Potentially Prohibited Uses.

(2) Formerly-established drive through uses may be permitted as a component of new development, subject to the development review process.

(3) The Combined Floor Area Ratio (FAR) is calculated with both residential and commercial building area.

(4) Calculation of FAR for master planned developments excludes rights-of-way.

(5) * Greater Maximum FAR may be permitted if otherwise determined by PUD, official development plan or other regulatory plan.

Retail Commercial

Maximum FAR of 0.35



This designation serves a variety of neighborhood and regional **commercial** needs and can be comprised of retail stores, eating establishments, banks, supermarkets and business and professional offices. Auto service stations, convenience stores, drive-through facilities and other similar uses may be limited and may not be allowed in areas that directly abut residential districts, public/quasi-public or institutional uses or public space. When permitted, such facilities shall use enhanced architectural design to be compatible with surrounding uses. Design of all retail commercial development must be consistent with the Retail Commercial Design Guidelines.

Development Standards

	<i>Requirement</i>
Land Use	
Primary Uses	Retail stores, eating establishments, banks, supermarkets, and business and professional offices
Limited or Potentially Prohibited Uses (1)	Pawn shops, car sales, massage parlors, tattoo parlors, video and other arcades, night clubs, off-track betting, auction houses, thrift stores, used merchandise sales, billiard parlors, gun shops, adult businesses, check cashing offices and day labor services
Development Characteristics	
Floor Area Ratio	Maximum 0.35
Site Characteristics	Generally limited to arterial street intersections to one or two corners. Neighborhood commercial development is allowed on collector streets.

(1) Uses may be limited or prohibited depending on their proximity to residential, public, or quasi-public uses or for other reasons as determined by the city.

Office

Maximum FAR of 0.35



This designation accommodates offices for medical, legal, banking, insurance and similar professional office uses. This designation is intended to be compatible with abutting residential and other sensitive uses. A limited amount of retail uses integrated into the office building is permitted **as a portion of the project gross floor area, or GFA** (see below for requirements).

Development Standards

Requirement

Land Use

Primary Uses	Professional and commercial offices (medical, business, real estate, law and consulting offices)
Secondary Uses	Support Commercial including eating establishments, pharmacies, personal business services, office supply (1)(2)

Development Characteristics

Floor Area Ratio	Maximum 0.35
Distribution of Uses	Maximum 15% of GFA Support Commercial or 10,000 sqft, whichever is less (3)(4)

(1) May be allowed through the city's development review process when developed in conjunction with, and accessory to, office buildings.

(2) Specific Retail Commercial uses may be limited or prohibited depending on their proximity to residential, public, or quasi-public uses or for other reasons as determined by the city. See the Retail Commercial designation for a list of Limited or Potentially Prohibited Uses.

(3) Commercial building area shall not exceed 50 percent of the ground floor of any one building.

(4) Support commercial uses may be further constrained by parking availability.



Office/R&D Low Intensity

Maximum FAR of 1.0



This designation is intended for campus-like development with offices, research and development facilities, medical facilities and supportive uses. Manufacturing and mass production space is limited to less than 30 percent of gross floor area on a lot. Accessory or small-scale supporting retail or personal/business services integrated into office buildings are also permitted up to 10 percent of gross floor area. Strategically located hotel uses that support employment uses may be permitted by PUD.

Development Standards

Requirement

Land Use

Primary Uses	Professional offices, research and development labs, medical facilities
Secondary Uses	Hotel Manufacturing, warehouse, production (±) Support Commercial including eating establishments, pharmacies, personal business services, office supply (1)(2)

Development Characteristics

Floor Area Ratio	Maximum 1.0
Distribution of Uses	Maximum 10% of GFA Support Commercial or 15,000 sqft, whichever is less (3) Maximum 30% of GFA Manufacturing, Warehouse and/or Production use

(1) Manufacturing and production space may not exceed 30% of gross floor area.

(1) May be allowed through the city's development review process when developed in conjunction with, and accessory to, office/R&D buildings.

(2) Specific Retail Commercial uses may be limited or prohibited depending on their proximity to residential, public, or quasi-public uses or for other reasons as determined by the city. See the Retail Commercial designation for a list of Limited or Potentially Prohibited Uses.

(3) Support commercial uses may be further constrained by parking availability.

Office/R&D High Intensity

Minimum FAR of 0.30 and Maximum FAR of 2.0



This designation identifies areas where higher-intensity employment uses are appropriate. These areas are located along major transportation corridors with high visibility and accessibility. Employment uses are emphasized, including high-rise or campus-like office developments and supportive research and development uses. Manufacturing and mass production space is limited to less than 10% of gross floor area. Accessory or small-scale supporting retail or personal/business service uses integrated into office buildings are also permitted up to 10% of gross floor area. Strategically located hotel uses are permitted by PUD. The desired type of development is multistory buildings served by a mix of structured and surface parking. Taller buildings should be located closer to major arterials to reinforce visibility and presence.

Development Standards

	<i>Requirement</i>
Land Use	
Primary Uses	Professional offices, research and development labs, medical facilities
Secondary Uses	Hotel Manufacturing, warehouse, production (1) Support Commercial including eating establishments, pharmacies, personal business services, office supply (1) (2)
Development Characteristics	
Floor Area Ratio	Minimum 0.3 Maximum 2.0
Distribution of Uses	Maximum 10% of GFA Support Commercial use, or 15,000 sqft, whichever is less (3) Maximum 10% of GFA Manufacturing, Warehouse and/or Production use

(1) Manufacturing and production space may not exceed 10% of gross floor area.

(1) May be allowed through the city's development review process when developed in conjunction with, and accessory to, office/R&D buildings.

(2) Specific Retail Commercial uses may be limited or prohibited depending on their proximity to residential, public, or quasi-public uses or for other reasons as determined by the city. See the Retail Commercial designation for a list of Limited or Potentially Prohibited Uses.

(3) Support commercial uses may be further constrained by parking availability.



Flex/Light Industrial

Maximum FAR of 0.5



This designation is intended to provide and protect land for flexible employment uses, including manufacturing and assembly, research and product development, warehousing and distribution facilities, and supportive office space. Flexible spaces may include storefront space for **offices**, sales and customer service. Auto-related service and self storage uses are also permitted. Uses that create objectionable levels of noise, vibration, odor, glare or hazards are not permitted. Outdoor storage must be screened from public right-of-way and non-industrial uses. **Support commercial uses integrated into flex/light industrial buildings are also permitted up to 10% of gross floor area.** In general, light industrial uses should be located away from residential areas and adequately buffered from other land uses. The city may impose a stricter standard for more intense industrial uses.

Development Standards

	<i>Requirement</i>
Land Use	
Primary Uses	Flex office space including professional office, research and development labs Warehousing, fabrication facilities, repair shops, wholesale distributors and light manufacturing
Secondary Uses	Support Commercial including eating establishments, pharmacies, personal business services, studios , office supply (1)(2)
Development Characteristics	
Floor Area Ratio	Maximum 0.5
Distribution of Uses	Maximum 10% of GFA Support Commercial use, or 15,000 sqft, whichever is less (3)

(1) May be allowed through the city's development review process when developed in conjunction with, and accessory to, office/R&D buildings.

(2) Specific Retail Commercial uses may be limited or prohibited depending on their proximity to residential, public, or quasi-public uses or for other reasons as determined by the city. See the Retail Commercial designation for a list of Limited or Potentially Prohibited Uses.

(3) Support commercial uses may be further constrained by parking availability.



Golf Courses



This designation applies to both public and private golf courses, including three public courses and two private courses. Public golf courses provide additional open space, natural habitat and trail connections that connect to the greater parks and open space network in the city.

Public/Quasi Public



This designation is intended for uses related to general community services, such as public safety facilities, schools and institutions of higher learning, places of worship, community centers, hospitals, municipal facilities and cemeteries. Future public and quasi-public uses such as private schools and recreation facilities, although not shown specifically on the Land Use Diagram, are generally allowed in residential areas subject to City review and approval. Places of assembly are also allowed in non-residential use categories subject to City review.

Major Creek Corridor on Non-Public Land

These areas are flood corridors within the 100-year floodplain located on private land. Flood corridor areas should remain undeveloped to protect property from flood damage, and to preserve the riparian habitat and wildlife associated with the area. Filling in of flood plains is generally prohibited except where flooding is caused by sheet flow. Where filling or channelization may be allowed, it must be a natural appearing design.

Development Potential

Projected development potential of the Comprehensive Plan assumes that the majority of vacant lands and sites with opportunity for redevelopment, infill or intensification, will develop over the 22-year Plan horizon ~~at~~ by 2035. However, the Plan is not intended to specify or anticipate when this development potential will actually be realized; nor does the designation of a site for a certain use necessarily mean that the site will be built/redeveloped with that use in the next 22 years.

The projected development potential outlined in Table 2-1 is based on assumptions of average intensities for the different land use classifications. However, it must be noted that the citywide development potential is not a fixed or final number. As time passes, new opportunities for redevelopment and infill will arise, beyond sites currently identified in this update effort. Planning for transportation and public infrastructure, particularly water resources and utilities, will continue to be reevaluated as future development potential is identified in subsequent Comprehensive Plan updates.

Table 2-1 shows:

- A. **Existing Development.** This reflects existing development as of August 2013.
- B. **Current Development.** This includes projects that are currently under construction, approved or proposed as of August 2013. This development includes 2,477 housing units and 1.0 million square feet of non-residential building space.
- C. **Gross New Development by 2035.** This value represents application of average assumed intensities to vacant lands and underutilized sites that will likely be developed over the next 20 years, or the 2035 plan horizon. Approximately 5,616 housing units and 8.9 million square feet of non-residential building space will likely be added.
- D. **Existing Development Lost.** This value reflects existing development that is likely to be lost due to redevelopment of underutilized sites.
- E. **Net New Development by 2035.** This reflects the total of the Existing, Current and Gross New development in the city less Existing Development Lost.
- F. **City at 2035.** Totaling Net New Development and Existing Development results in the Comprehensive Plan development potential at 2035. This will result in an increase of approximately 8,100 housing units and 8.8 million square feet of non-residential space.



The city will continue to build high quality housing and residential neighborhoods to further attract employers and workers to the city.



Employment growth is a focus of the Comprehensive Plan in order to providing a range of employment options for the city's residents as well as to foster business growth and synergy within the city.

Total population by the 2035 Plan horizon is expected to grow by approximately 20 percent to 130,100—an increase of approximately 21,000 new residents, based on a projected 2035 population to household ratio of 2.58 by DRCOG. Employment in the city will also grow substantially, with the potential for 59,250 jobs in the city by 2035—the majority of which would be in retail and office/R&D industries. This would increase the existing job base in the city by approximately 50 percent.

Jobs to Housing Balance

The relationship between jobs and housing is a reflection of whether a city has a deficit or surplus of jobs relative to employed residents. A balance between the two would be a 1:1 ratio, and would indicate that in-commuting and out-commuting are matched, leading to efficient use of the transportation system, particularly during peak hours. The Comprehensive Plan looks to improve the balance between jobs and housing (reflected by the number of employed residents) in the city. As of 2013, the city's ratio is an estimated 0.59 jobs to employed residents (reflecting approximately 39,300 jobs and 66,700 employed residents in the city).¹ In comparison, both Adams and Jefferson counties had ratios of 0.70, with Denver almost double with 1.35 jobs to employed residents (Table 2-2).²

To achieve an improved balance, the Plan focuses on attracting higher intensity employment development into the city, in both mixed-use areas and along the city's major employment corridors like US 36 and I-25. The city's wide range of housing types will continue to attract employers and workers to the city. With nearly 18,000 new jobs expected over the next 20 years alone, the City can expect a jobs/housing ratio of approximately 0.63—an improvement that reflects a conservative projection of job gain into the future.

Table 2-2: Jobs to Housing Comparison

<i>Place of Comparison</i>	<i>Jobs</i>	<i>Employed Residents</i>	<i>Jobs/Emp. Residents</i>
City of Westminster	39,300	66,700	0.59
City of Arvada	27,500	59,600	0.46
City of Broomfield (City & County)	30,000	31,900	0.94
City of Thornton	25,900	66,400	0.39
Denver (City & County)	443,000	328,900	1.35
Adams County	162,300	234,400	0.69
Jefferson County	215,200	305,300	0.70

Sources: American Community Survey 2012 data for employed residents; cities of Westminster, Arvada, Thornton and Broomfield, DRCOG and Colorado Department of Labor for jobs estimates. Estimates rounded to the nearest 100th.

¹ American Community Survey, 2012 Data.

² Colorado Department of Labor, 2012 Annual Labor Market Estimates and Employment by Industry.



2.3 REDEVELOPMENT

Urban Renewal Areas

The city currently has seven active officially designated Urban Renewal Areas. These Urban Renewal Areas are administered by the Westminster Economic Development Authority (WEDA), for which City Council members serve as the Board Members. The Urban Renewal Area designation allows WEDA to finance capital improvements and land assembly to incentivize redevelopment and improve physical conditions in key areas of the city. WEDA generally gains its revenues from increases in property taxes within these areas. Within the redevelopment project areas, WEDA has the power to make capital improvements to the “public realm”; those areas and elements that serve a public purpose, including parks, plazas, utilities and roads, landscaping and parking.

The redevelopment areas are shown in Figure 2-3 and include:

- South Westminster, the second phase of which will expire in 2017.
- Westminster Center (encompassing the proposed downtown Westminster area) adopted in 2009 and will be active for 25 years from the date tax increment collection is established.
- Westminster Center East, adopted in 2002 and active through 2027.
- Mandalay, adopted in 2003 and active through 2027.
- North Huron, adopted in 2004 and active through 2028.
- Holly Park, adopted in 2004 and active through 2028.
- South Sheridan, adopted in 2004 and active through 2028.

Additional Redevelopment Opportunities

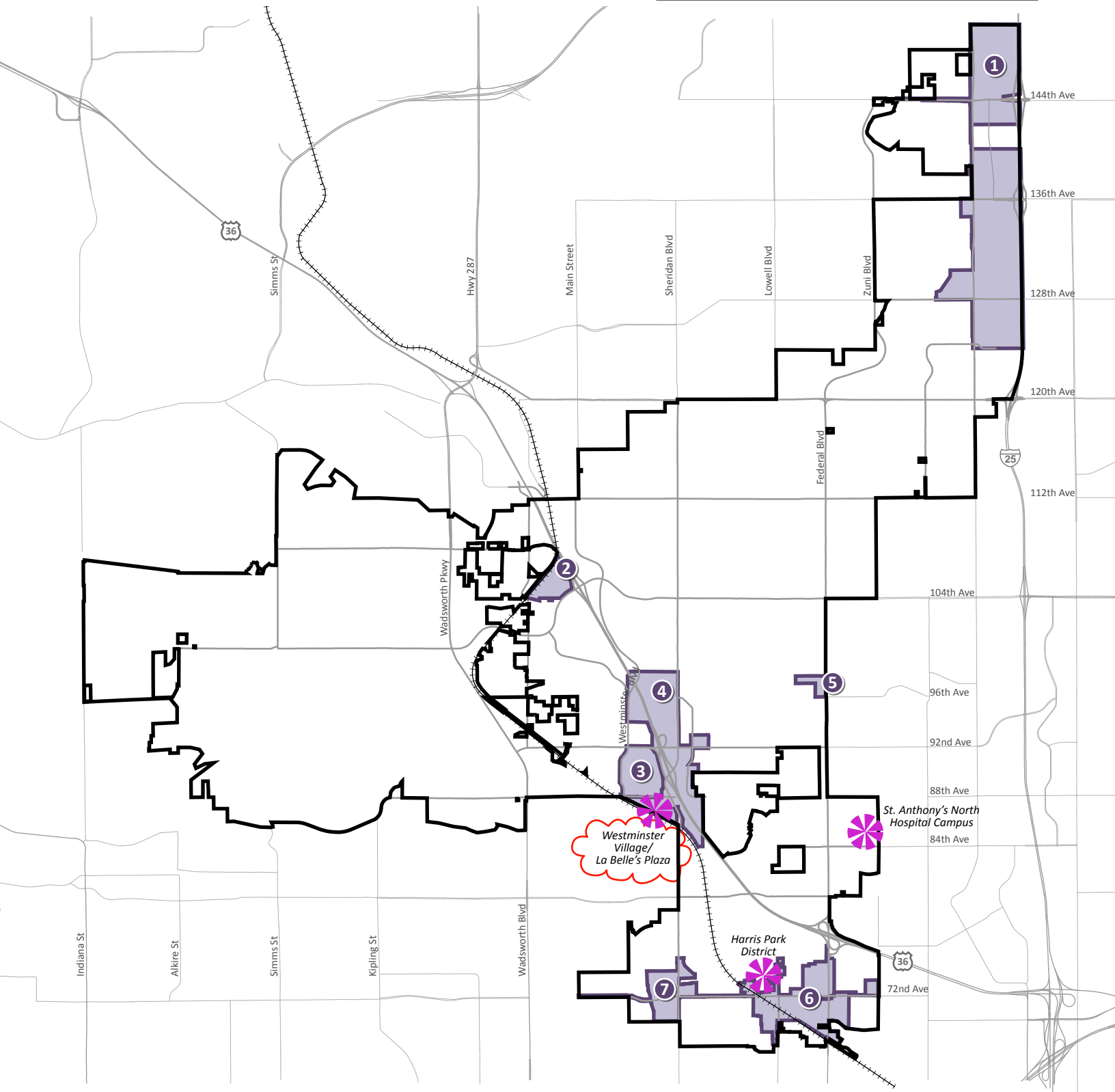
In addition to the city’s Focus Areas identified in the Comprehensive Plan, there are several key redevelopment and infill opportunities in the city. These sites have existing development that may or may not redevelop over the **future Plan horizon**. **Key** ~~These sites that may have potential for redevelopment~~ include:


- *Westminster Village/LaBelle’s Plaza*, located at 88th Avenue and Sheridan Boulevard, consisting of existing older retail strip centers and large format retail stores. Over time, as the downtown Westminster area develops into an active, mixed-use downtown destination, there may be opportunity to take advantage of the synergy created by the new downtown, existing park-and-ride and future commuter rail station at the western end of the site. The area is also directly adjacent to the planned

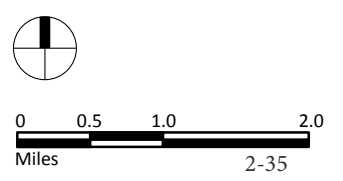


LaBelle’s Plaza, extending south from 88th Avenue on the west side of Sheridan Boulevard, is an older commercial strip center that is nearing the end of its building lifecycle.

Figure 2-3: Urban Renewal Areas & Redevelopment Opportunities



- 1** North Huron Urban Renewal Area
- 2** Mandalay Urban Renewal Area
- 3** Westminister Center Renewal Area
- 4** Westminister Center East Urban Renewal Area
- 5** Holly Park Urban Renewal Area
- 6** South Westminister Phase I & II Urban Renewal Areas
- 7** South Sheridan Urban Renewal Area
-  Potential Redevelopment Opportunity





Outside City Limits

Land ~~in the Sphere of Influence~~ outside of the outer limits of the city is located primarily to the south in Adams County and to the west in Jefferson County. Abutting land area within Jefferson County is envisioned as remaining agricultural and/or sparsely developed to protect water quality of ~~resources like Standley Lake.~~ ~~and~~ ~~Similarly, land adjacent to Hidden Lake is identified for agricultural and/or very low intensity use.~~ ~~To the southeast~~ Further to the east, in Adams County, land abutting the city is primarily developed, with the exception of a portion of the Northgate site directly east of the Westminster Station Area, which is envisioned as a traditional mixed use neighborhood east of Federal Boulevard. This site will likely be annexed as part of the overall Northgate development.



Areas adjacent to major water resources like Standley Lake and Hidden Lake will ideally remain very low density to minimize development impacts on regional and city resources.



POLICIES

Citywide policies focus on strategic growth that will ensure the city continues to develop within its fiscal, economic and infrastructure means. They also place emphasis on regional coordination to ensure Westminster continues to play a significant role as an employment and activity center in the Denver Metropolitan area.

- LU-P-1** Ensure land uses are consistent with the Comprehensive Plan Land Use Diagram in Figure 2-2 and land use classifications in Section 2.3.
- LU-P-2** Update the Municipal Code to support mixed-use development, land use densities and development standards to ensure its compliance with the Comprehensive Plan.
- LU-P-3** Ensure that new development is consistent with minimum and maximum intensities and densities for development. Residential densities are calculated using the gross acreage of the site, excluding land area within 100-year flood plains.
- LU-P-4** Ensure that adequate infrastructure and public services are available for new development. Evaluate the impact of new development to the city's future water supply, considering land use, intensity and proposed conservation measures.
- LU-P-5** Create a new downtown focused on the former Westminster Mall site.
- Establish a street grid and block structure that accommodates all travel modes with a priority for pedestrian circulation;
 - Create an attractive, connected public realm with a range of parks, open space and recreational opportunities;
 - Foster a mix of commercial, office and residential uses, encouraging a vertical mix of uses in buildings; and
 - Establish a distinct area within the downtown that is the center of activity, culture and identity for the city.
- LU-P-6** Encourage the establishment and intensification of activity centers that provide a mix of uses, transit and attractive, walkable environments.
- LU-P-7** Continue to diversify commercial uses in the city to insulate the city's fiscal base from downturns in individual markets.



New land use designations foster vertical mixed use development, where residential or office spaces are located above commercial uses at the ground floor. These higher-intensity development types will foster growth and activity in areas like Westminster Station and downtown Westminster.



GOALS

- F-G-6** Develop a regional employment center within the North I-25 Focus Area.
- F-G-7** Foster a cohesive, **development** high quality development character and identity for the area.
- F-G-8** Build on existing synergies in the area to attract a range of businesses.



POLICIES

- F-P-20** Establish an employment district with a range of office and research and development uses.
- F-P-21** Facilitate multimodal connectivity between the Orchard Town Center and surrounding commercial development to support the day time population.
- F-P-22** Extend Orchard Parkway through the focus area as the central spine of activity. Ensure development provides an active frontage along this street. Development should also be oriented to I-25 and Huron Street, with parking located away from public view.
- F-P-23** Locate taller buildings closer to the freeway, oriented and spaced to maximize views into the district.
- F-P-24** Provide safe, enhanced pedestrian crossings of Orchard Parkway and 144th Avenue to facilitate connectivity between activity nodes.
- F-P-25** Incorporate open space and landscape features as integral elements of the development.
- F-P-26** Establish a distinctive streetscape and site design throughout the area that creates identity through key elements like street lighting, landscape and public art.
- F-P-27** Provide trail connections to existing trail systems, including the McKay Creek Trail, Quail Creek Trail and Big Dry Creek Trail.



The Orchard Town Center retail and residential uses just north of the focus area will be a key amenity for employment uses.



Figure 3-6: Brookhill Focus Area Illustrative Concept





This analysis focuses on existing and future projected traffic counts and roadway traffic volumes. The CRP also evaluates traffic speeds and driving behavior, accident history and conflicts between circulation modes to identify additional opportunities for improved circulation in the city. Additionally, the CRP emphasizes multimodal integration of pedestrian and bicycle circulation along the roadway network, looking at quantity and quality of the travel experience, continuity, visual interest and supporting amenities.

Street System

Westminster’s street system is comprised of local neighborhood streets and collectors and a citywide arterial system. Local neighborhood streets and collectors are designed to provide access to adjacent properties from the arterial system. The arterial system delivers traffic between the freeways, other arterials and the local neighborhood street system. **The CRP classifies the city’s arterial system into three major arterial types: 2-3 lane street, 4-5 lane street, and 6-7 lane street. The number of lanes is primarily related to the capacity of each arterial.** This arterial system is anchored by several north-south corridors—Wadsworth Parkway, Sheridan Boulevard, Federal Boulevard and Huron Street—and east-west corridors—144th Avenue, 136th Avenue, 120th Avenue, 112th Avenue, 104th Avenue/Church Ranch Boulevard, 92nd Avenue and 72nd Avenue. ~~The capacity of the city arterial system is primarily related to the number of lanes provided for through traffic.~~ Table 5-1 shows the general daily traffic capacity for each arterial street type in the city and classification of the city’s major arterials. **Figure 5-1 reflects the most recently adopted CRP.**



The city’s primary arterial streets include Sheridan Boulevard, Federal Boulevard and 120th Avenue.







Type of Street	Capacity (Average Daily Traffic Volume)	Examples within the City
6-7 lane street	53,000	Sheridan Boulevard north of 112th Avenue Huron Street north of 136th Avenue
4-5 lane street	36,000	72nd Avenue 80th Avenue 92nd Avenue Church Ranch Boulevard/104th Avenue 112th Avenue Huron Street south of 136th Avenue Wadsworth Parkway Sheridan Boulevard Federal Boulevard
2-3 lane street	18,000	Lowell Boulevard Old Wadsworth Boulevard Simms Street



Source: Highway Capacity Manual, Transportation Research Board

Figure 5-1: Street Network







Legend

2035 Existing Street Network




-  Limited Access Roadway
-  Arterial and Collector Streets
-  6-Lane
-  5-Lane
-  4-Lane
-  2-Lane

-  ~~Collectors Local Streets~~
-  ~~Local Streets Private Streets~~

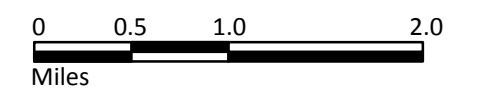
Planned Improvements Future Street Network

-  Planned Street Connection
-  Planned Intersection Improvement
-  Planned Street Improvement
-  Potential Street Connection
-  Potential New Interchange
-  Potential Streetscape Improvements

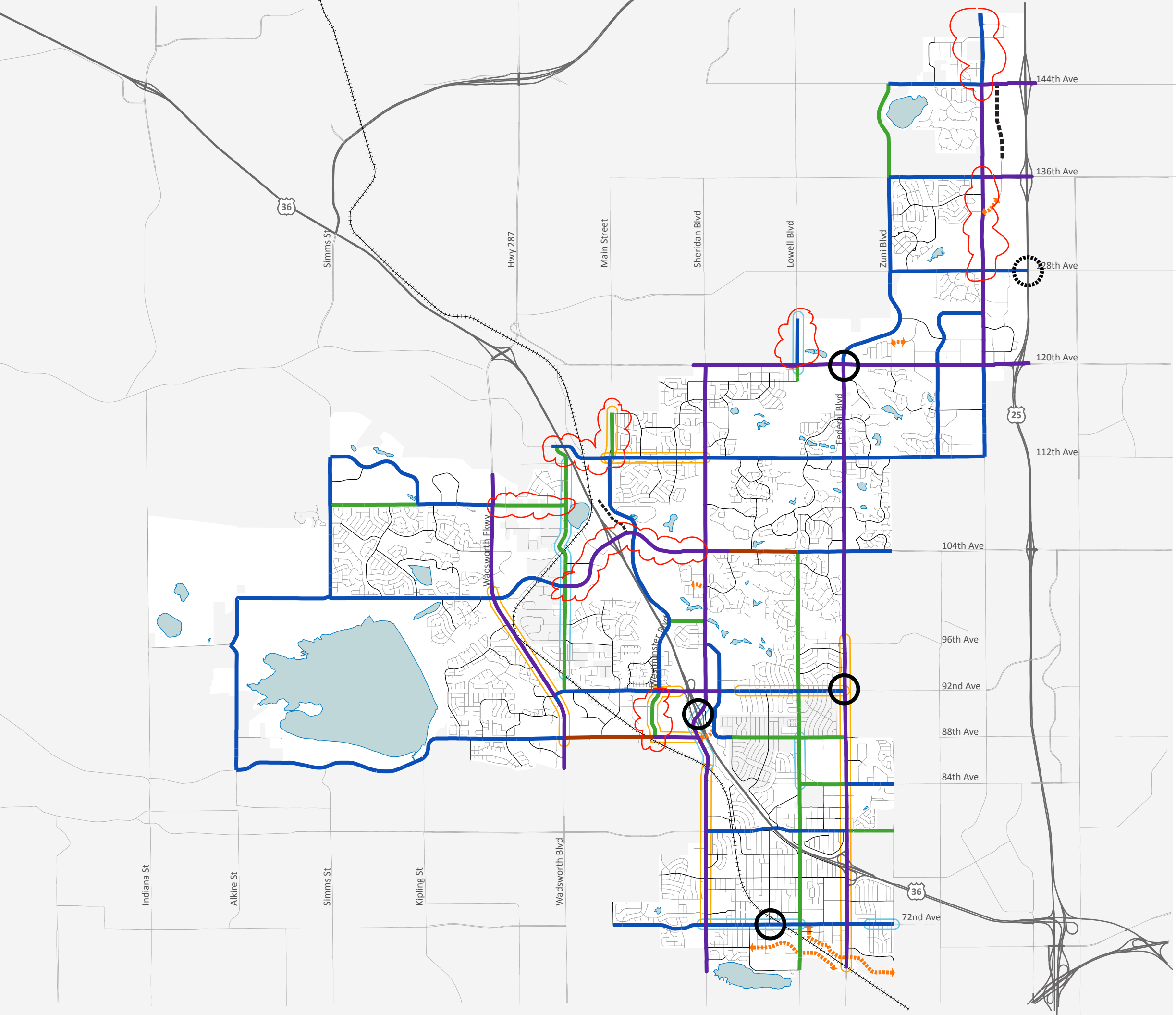
Planning Area

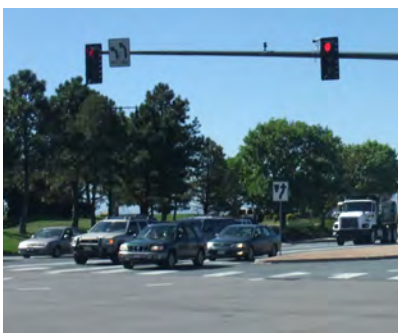
-  Parks/Open Space/Golf Courses
-  Water
-  City Limits

Updates 3/17/14



Updated 3/17/14





The city works to improve pedestrian facilities by providing separated sidewalks, accommodate transit and ensure that traffic flow for vehicles are generally below the threshold of congestion.

The intent of the ~~Roadway Plan~~ CRP is to prioritize through connections for the majority of vehicles traveling on the city's roadway system. Typically, recommendations for improvements are made for intersections operating at an LOS worse than D, where improvements would bring the facility to an LOS of D or better, and for streets that significantly exceed the Threshold of Congestion.

Traffic Conditions

Traffic volumes and levels of service for existing conditions are described in the CRP, which includes an analysis of future traffic conditions. The traffic modeling includes assumptions for future development consistent with the Comprehensive Plan as well as the Denver Regional Council of Governments (DRCOG) traffic model. The ~~Roadway Plan~~ CRP currently projects traffic conditions through 2030 and will be updated to include 2035 DRCOG model and Westminster Comprehensive Plan projected growth. Major roadways that are currently (as of 2013) over capacity are listed in Table 5-4.

All of the roadways that currently fail to operate at acceptable levels of service (i.e. have reached the Threshold of Congestion in terms of average daily traffic volumes) are proposed to have improvements in roadway capacity. Typically, improvements for congested arterial streets include adding additional through lanes or adding turn lanes at intersections. Over the years, the city has widened congested streets to improve traffic flow and reduce frustration by drivers. In many cases, the city has partnered with neighboring cities, developers and CDOT to implement these improvements.

However, there may be instances where goals for pedestrian walkability are emphasized over those for through vehicle traffic. Priorities for ease of travel are evaluated through the planning and urban design process to ensure that goals for overall quality of life, access to transit and services, and accessibility to key destinations by multiple modes are weighed and evaluated. Planning for the Westminster Station and downtown Westminster areas, as well as other higher intensity mixed-use areas that emphasize walkability and transit access, will consider the need for a balanced system that responds to context and the needs of the community as a whole.

Planned Improvements

The Comprehensive Roadway Plan (CRP) recommends intersection and roadway improvements to mitigate existing deficiencies and future traffic impacts projected through 2030. Improvements along the US 36 corridor, I-25, Wadsworth Parkway and other state highways and regional corridors are also outlined in the CRP.



Key planned improvements that will have a significant impact on some of the city’s most severely congested arterial streets include two projects along 120th Avenue and one along Sheridan Boulevard. The 120th Avenue and Lowell Boulevard intersection improvement will include adding a second left turn lane for 120th Avenue and Lowell Boulevard traffic and adding a third eastbound through lane on the southern Westminster side. The 120th Avenue and Federal Boulevard intersection improvement will include a third eastbound and westbound lane on 120th Avenue and two additional lanes north of 120th Avenue on Federal Parkway. Double left turn lanes will be provided for all four quadrants of the intersection. The projects will be completed in early 2014 and early 2015, respectively. Along Sheridan Boulevard, the bridge over US 36 will be replaced with a six lanes (from the existing four-lane configuration) and additional left turn lanes.



Accommodation of projected growth through the 2035 Plan horizon may require additional improvements to the city’s roadway system, outside of those already planned and outlined in the CRP and Capital Improvements Plan. These improvements will be identified in future updates to the CRP. Likewise, all new development will continue to be evaluated in terms of impacts to the city’s roadway system and intersection operations.

Table 5-4: Congested Roadways in Westminster as of 2011

Street	Lanes	Average Daily Traffic (2011)	% Over Threshold of Congestion	% Over General Daily Traffic Capacity
Sheridan Blvd: 88th Ave to US 36	4	55,863	80.2%	55.2%
120th Ave: Lowell Blvd to Federal Blvd	4	45,535	46.9%	26.0%
120th Ave: Federal Blvd to Pecos St	4	42,171	36.0%	17.1%
120th Ave: Huron Street to I-25	6	69,858	32.3%	14.8%
120th Ave: Sheridan Blvd to Lowell Blvd	4	40,678	31.2%	13.0%
104th Ave: US 36 to Westminster Blvd	4	40,006	29.1%	11.1%
Sheridan Blvd: 80th Ave to 76th Ave	4	39,877	28.6%	10.8%
Federal Blvd: 84th Ave to 76th Ave	4	38,714	24.9%	7.5%
Sheridan Blvd: 88th Ave to 80th Ave	4	37,371	20.6%	3.9%
Sheridan Blvd: 73rd Ave to 76th Ave	4	35,222	13.6%	n/a
Federal Blvd: US 36 to 74th Ave	6	50,255	9.6%	n/a
Wadsworth Pkwy: 92nd Ave to 100th Ave	4	33,953	9.5%	n/a
Federal Blvd: 70th Ave to BNSF Railroad	4	33,848	9.2%	n/a
Sheridan Blvd: 104th Ave to 96th Ave	4	32,671	5.3%	n/a
Federal Blvd: 104th Ave to 92nd Ave	4	31,489	1.6%	n/a
Church Ranch Blvd: US 36 to 103rd Ave	4	31,320	1.0%	n/a





* The threshold for congestion is 31,000 Average Daily Traffic (ADT) for a 4-5 lane road and 46,000 ADT for a 6-7 lane road.

**The General Daily Traffic capacity is 36,000 ADT for a 4-5 lane road and 53,000 ADT for a 6-7 lane road.





Figure 5-2: Bicycle & Pedestrian Network

Legend





Bicycle Network

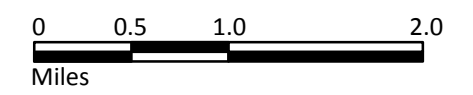
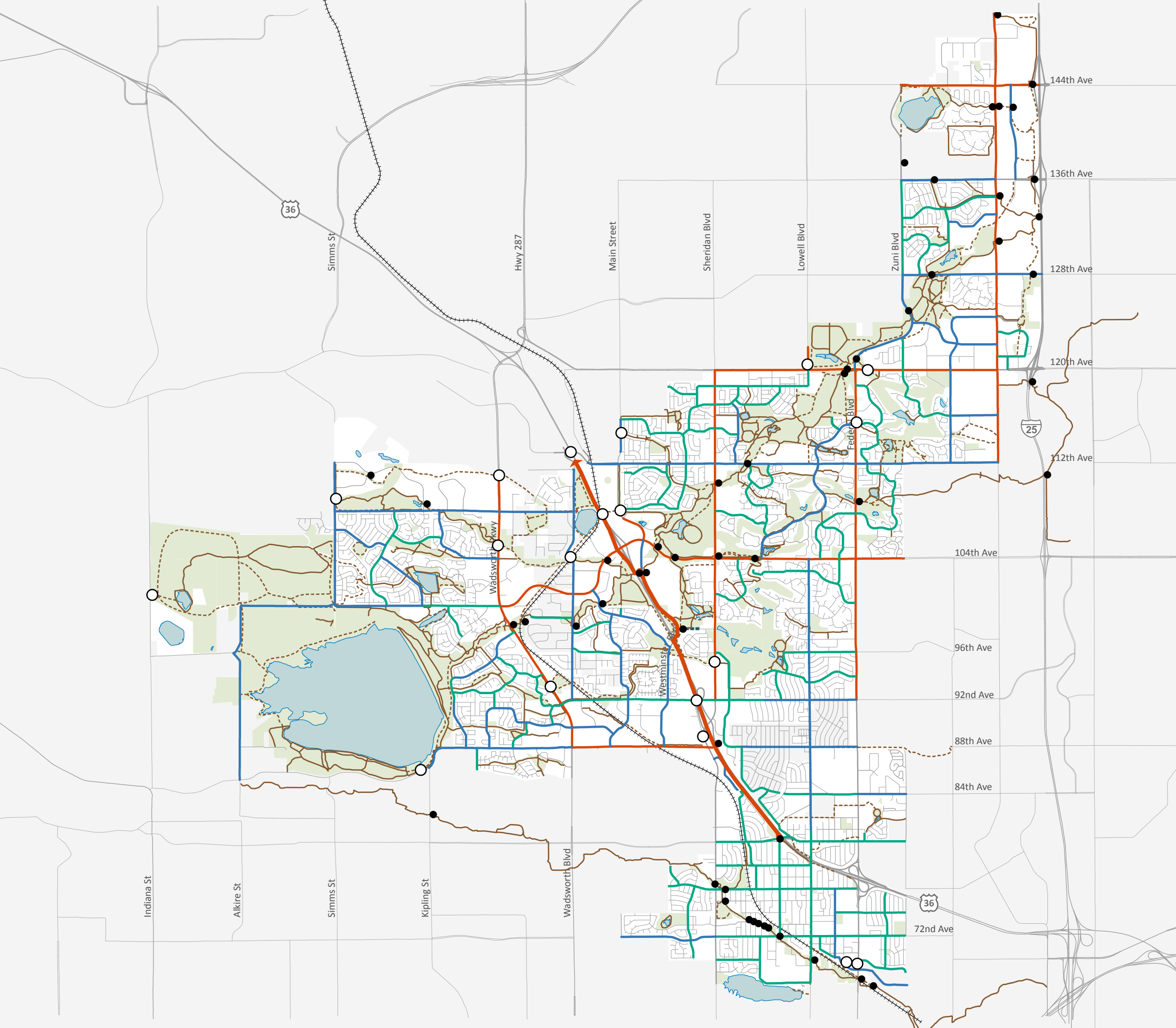
-  US 36 Commuter Bike Trail
-  Class I Side Path
-  Class II Bicycle Lane
-  Class III Sharrow or Signed Bike Route

Future Street Network

-  Trail and Shared Use Bike Path
-  Proposed Trails
-  Existing Pedestrian Underpass
-  Proposed Pedestrian Underpass

Planning Area

-  Parks/Open Space/Golf Courses
-  Water
-  City Limits
-  Rail Corridor



Updated 3/17/14



Table 5-5: Bikeway Class Definitions

<i>Bikeway Class</i>	<i>Definition</i>	<i>Total Proposed (miles)</i>
Class I		
Shared Use Path*	Off-street, dual direction path often shared with pedestrians	5
Sidepath	Shared use path located adjacent to but separated from a vehicular street, resembling a wide sidewalk	27
Class II		
Bike Lane	On-street lane reserved for bicyclists, separated by painted lines, symbols and signage	46
Class III		
Signed Bicycle Route	Travel lanes shared fully with motor vehicles, marked as Bike Route with signage	14
Signed Bicycle Route with Shared Use Markings	Travel lanes shared fully with motor vehicles but identified by “sharrow” markings on pavement	40
Total Bikeways		132

**Including shared use trails*

Pedestrian Circulation

Fostering a walkable, pedestrian-friendly environment throughout the city is a significant consideration of the Comprehensive Plan land use, urban design and ~~the~~ multimodal circulation policy framework. Westminster has an extensive trail system augmented by connections to and through neighborhoods, shopping centers, parks, schools and employment areas. Connectivity along the city’s pedestrian (and bicycle) network is facilitated by 40 underpasses that circumvent the need to cross major arterial roadways at grade. Additionally, over the past 20 years, the city has required new developments along major arterial streets to provide wide landscaped amenity zones with eight-foot sidewalks separated from the street by 12-foot landscaped area. All of these improvements have been focused on creating a safe, pleasant environment for pedestrians and bicyclists in the city.

Existing pedestrian facilities in the city include sidewalks, paths, trails, pedestrian bridges, pedestrian/trail underpasses and crosswalks. Sidewalks are located on both sides of the street throughout the majority of the city, with a few exceptions as noted on Figure 5-2. As new development occurs, particularly in infill or redevelopment areas, pedestrian connections will be emphasized in areas with access to transit, parks or open space facilities, ~~neighborhood and within and to~~ services and major activity centers. Improvements to existing facilities, including infill of missing portions of sidewalks and construction of detached sidewalks (provision of a lawn or landscaping to move pedestrians further away from on-street vehicle traffic), will continue to be pursued. Likewise, the city will continue to develop strategic pedestrian underpasses as funding is available and development



The city is currently planning for several improvements to transit, most notably the commuter rail station at 70th Avenue and Federal Boulevard, above. The Westminster Center Park-and-Ride, below, is one of the busiest in RTD's service area.

occurs.

5.3 PUBLIC TRANSIT

Facilitating access to transit is a key focus of the Comprehensive Plan. The Plan emphasizes mixed-use, transit-supportive development around existing park-and-ride bus facilities as well as future and planned commuter rail stations. Pedestrian and bicycle connections to these transit facilities are emphasized. Within Westminster, existing and planned transit service is provided by the Denver Regional Transit District (RTD) bus and future commuter rail service. RTD transit service also provides direct access to Denver International Airport from the Wagon Road and Westminster Center park-and-rides. Call-n-ride services for seniors and disabled persons are ~~also~~ provided by RTD and Jefferson and Adams counties. Figure 5-3 illustrates existing bus routes and future planned bus and commuter rail service that will serve the city.

Bus Service and Facilities

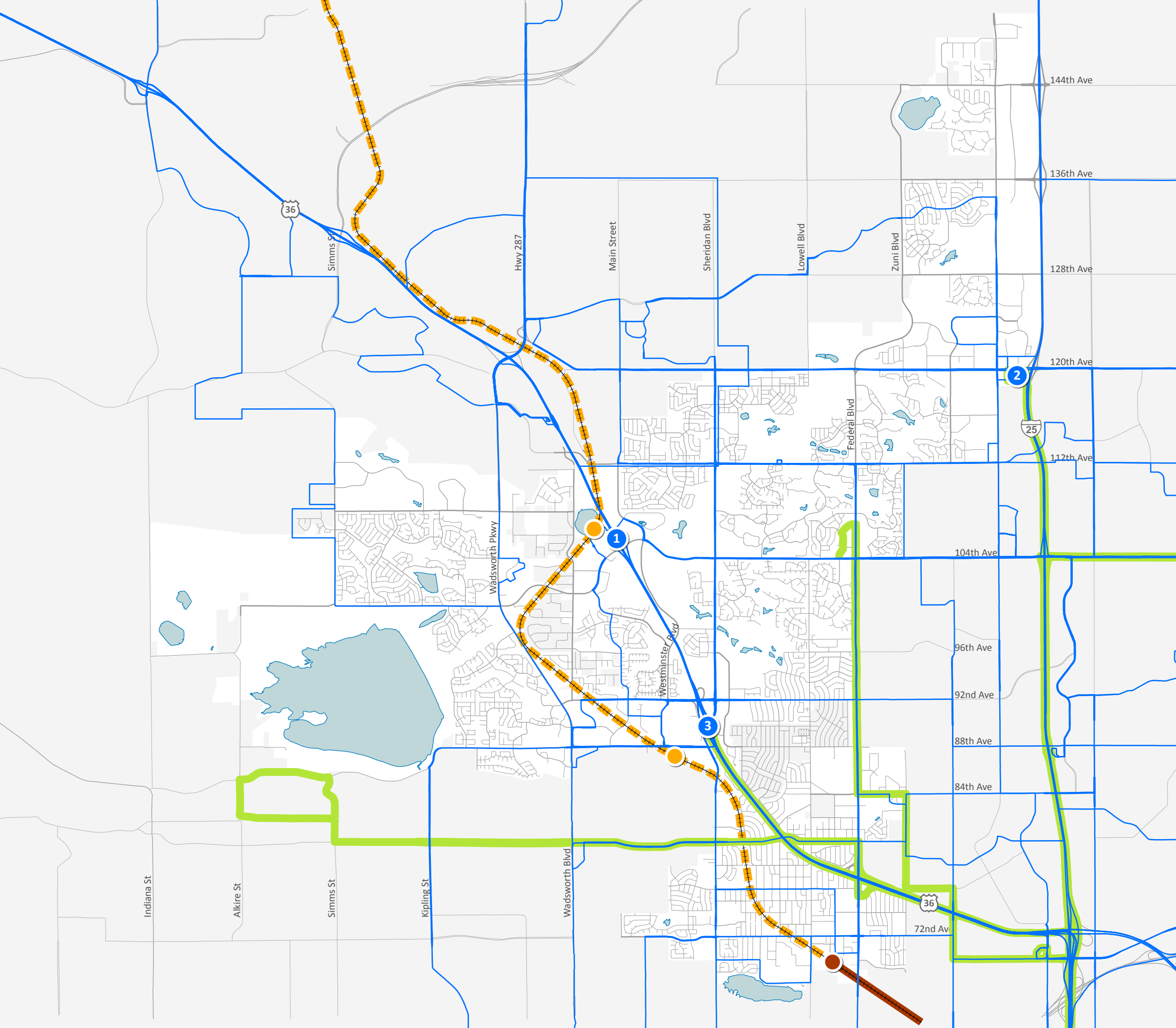
The primary form of transit service in the city is RTD bus service on local streets and major highways. Bus service includes both express bus lines that run along US 36 and I-25 and local routes that run along major arterials through the city. These lines connect Westminster with Denver and Boulder as well as surrounding communities. Three existing park-and-rides are located in the city, including Church Ranch, Westminster Center and Wagon Road. The Westminster Center park-and-ride is one of the most active park-and-ride facilities along the entire RTD corridor with over 2,500 combined boardings and allightings and 850 combined east-and westbound bus trips a day.¹ The city will continue to work collaboratively with RTD to ensure that adequate service, route additions or modifications, and facility improvements are provided in concert with new development and to address existing deficiencies.

Future Commuter Rail and BRT









Several major improvements to the city's transit system are underway. The city will have its first commuter rail station operational in 2016. Westminster Station, planned as part of the FasTracks Northwest Rail Corridor will be an end-of-line facility until future segments of the rail corridor are completed. The station is located at approximately Irving Street and 69th Avenue, in the heart of South Westminster. High intensity, transit supportive development planned around the station as well as potential infill and redevelopment in the surrounding area will help foster ridership for this station. Future FasTrack stations in the city are planned for downtown Westminster at approximately 88th Avenue and Harlan Street and Church Ranch just north of the Shops at Walnut Creek, as shown in Figure 5-3. In addition to commuter rail improvements, bus service along US 36 and I-25 is planned to be augmented to a bus rapid transit (BRT) service via a high occupancy vehicle lane.

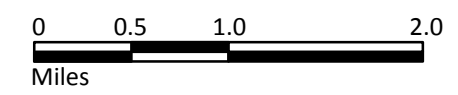
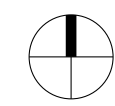
¹ Nataly Erving, Denver Regional Transportation District, September 2013.

Figure 5-3: Transit Network



Legend

-  RTD Bus Route
-  Express RTD Bus Route
-  Planned RTD FasTracks Commuter Rail Line
-  Future RTD FasTracks Commuter Rail Line
-  RTD Park and Ride
 1. Church Ranch Park and Ride
 2. Wagon Road Park and Ride
 3. Westminster Center Park and Ride
-  Water
-  City Limits
-  Rail Corridor



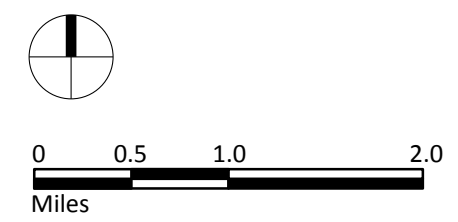
Updated 3/17/14

Figure 6-1: City Structure

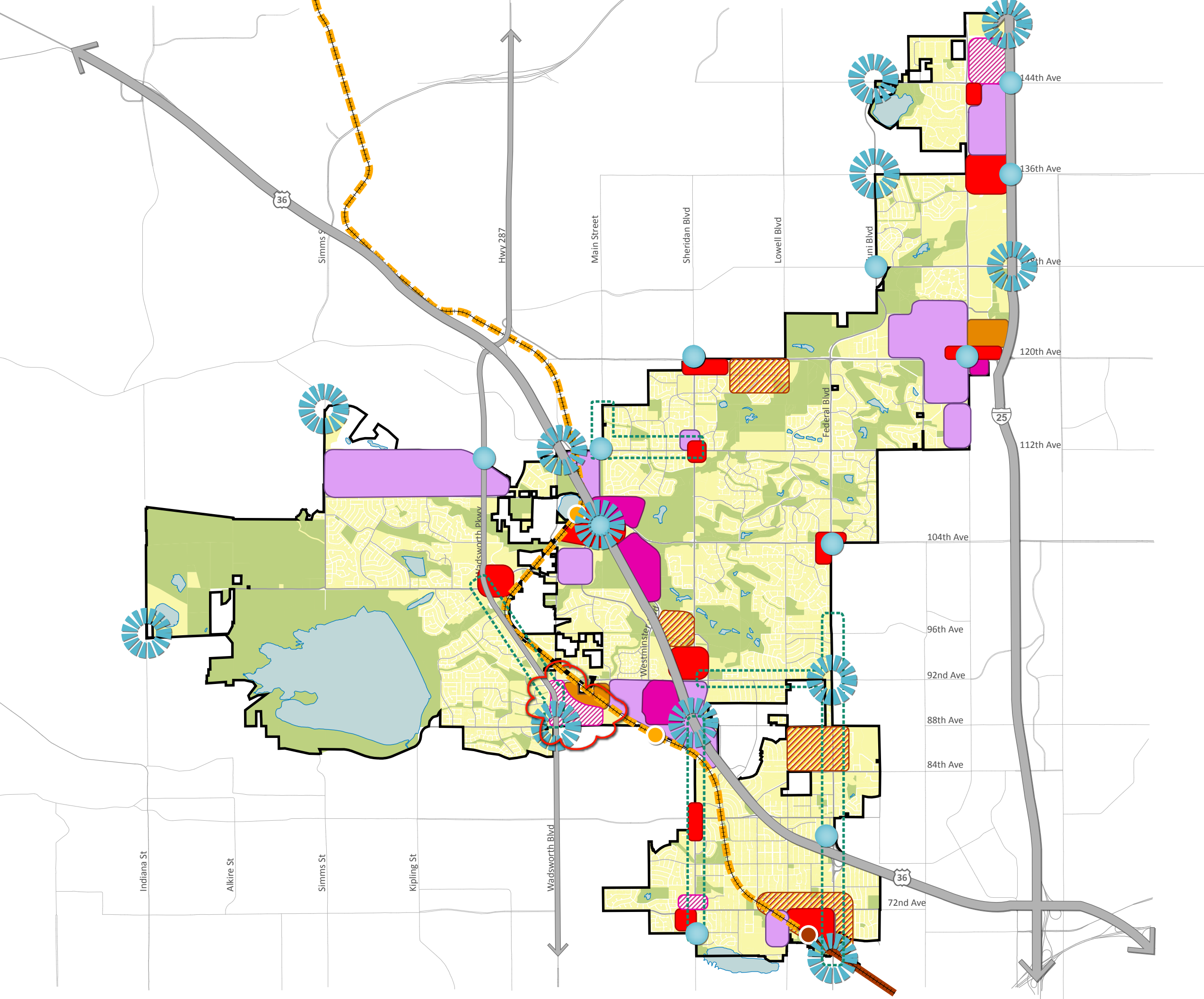
Legend

- Low and Medium Density Residential
- High Density Residential
- Traditional Mixed Use Neighborhood
- Mixed Use
- Mixed Use Center
- Retail Commercial
- Employment
- Parks/Open Space/Golf Courses
- Existing Gateway Signage
- Gateway Opportunity
- Streetscape Improvement Opportunity
- Major Transportation Connection
- Planned FasTracks Commuter Rail Line
- Future FasTracks Commuter Rail Line
- Water
- City Limits
- Rail Corridor

Updates 3/17/14



Updated 3/17/14





6.2 COMMUNITY DESIGN AND BUILT FORM

Streets, landscape and the development beyond comprise the visual and physical fabric of a city. The quality of design and organization of these components directly impacts the perception and experience of a place. From the design of a residential neighborhood to the character and quality of development along commercial corridors, the design of the built realm plays an important role in the way people live in and experience the city. If a neighborhood is designed well and connects people to amenities and services, inhabitants are more likely to walk or bike to a destination than drive. Similarly, the design of employment and commercial areas can impact whether workers and visitors walk or drive to a destination, whether businesses choose to locate in a specific location, and whether people choose to come to Westminster for shopping or services.

This section provides direction for overall design of the city's built realm as well as more specific direction for neighborhoods, employment centers and commercial corridors. The goals and policies provide a framework for community design and are further delineated by the city's existing design guidelines and standards. Design direction for specific mixed-use and activity centers in the city is provided in the Focus Areas chapter.

Neighborhoods

Westminster has a range of neighborhood types and scales that offer a variety of living environments, housing types and levels of affordability. The Comprehensive Plan looks to maintain the quality and variety of existing neighborhoods and create high quality, cohesive new neighborhoods. Connections to and from neighborhoods to nearby parks, schools, shopping and services are emphasized both for existing and new development. For new neighborhoods designed with the Traditional Mixed Use Neighborhood Development (TMUND) designation, these elements should be integrated into the neighborhood, with a mix of housing types, parks and community facilities as well as a neighborhood focal point. New residential neighborhoods should also integrate access and location of amenities into their overall design. Residents should be able to walk or bike to amenities along safe, comfortable connections. For developments with higher density residential components, these connections are essential, particularly in terms of encouraging walking over driving to services, amenities and transit.

Architectural and site design are also important aspects of neighborhood quality. The City has established a framework of design guidelines that encourage high quality neighborhood and architectural design for single family **attached and detached**, multifamily, **senior housing** and TMUND neighborhoods. Street and building orientation, landscaping, pedestrian connectivity and walkability, and high quality architecture and materials are



The quality and variety of residential neighborhoods are a significant factor in attracting employers, workers and new residents to the city. Over the years, Westminster has worked to preserve, improve and create well-designed, attractive neighborhoods throughout the city.



Employment centers like Westmoor Corporate Park and Park Centre are attractive and take advantage of views and access to open space.



Many corridors in the city include older and outdated commercial strip malls. The Comprehensive Plan encourages updating these centers with building and site improvements and infill, or redevelopment to mixed-use activity centers.

all emphasized.

Employment Centers

Key existing employment centers in the city include Westmoor Corporate Center, Church Ranch Business Park and Park Centre. The North I-25 area is an emerging employment center, with expansion of the St. Anthony's North Medical Center providing a key anchor for the area. High-intensity employment is also envisioned along the US 36 corridor within the Church Ranch Focus Area south of Big Dry Creek and in Circle Point.

The quality and character of the city's employment centers play a significant role in whether businesses choose to locate and remain in the city. It is important that these areas establish a strong sense of place through building design and placement, landscaping and wayfinding. They also must provide convenient access from major transportation corridors and transit as well as to everyday services. Internal and external pedestrian and bicycle connections are also important, particularly in campus-like environments where employment areas can often be closed off from surrounding development. Site design should emphasize the building relationship to landscapes, natural settings and views, with views of parking minimized. Finally, architecture, particularly of office and R&D facilities, should be enhanced with ample articulation, changes in height and massing, and high quality materials.

Commercial Corridors

The city has multiple well established commercial corridors that traverse the city. The most significant of these corridors are Federal Boulevard, Sheridan Boulevard and Wadsworth Parkway. Much of the commercial development along these corridors predates the more contemporary freeway orientation of retail in the city along US 36 and I-25. Developments range from single use service commercial uses to significant mid- and large-box retail shopping centers. Many of the larger retail centers are suffering due to a combination of age, competition with centers located closer to freeways, and changes in the retail industry that places less emphasis on mid-box stores.

The Comprehensive Plan emphasizes a greater mix of uses along these corridors, as delineated in Chapter 2: Land Use, and the Land Use Diagram. However, design of development along these corridors will also have an impact on potential for revitalization and new activity. The Plan emphasizes greater continuity of development, through improvements to streetscape, bringing more buildings up to the street edge, building orientation, attention to access for all modes and a mix of uses, where appropriate.

Figure 6-2: Views

Legend

- Vista
- View Corridor
- Parks/Open Space/Golf Courses
- Water
- City Limits
- Rail Corridor

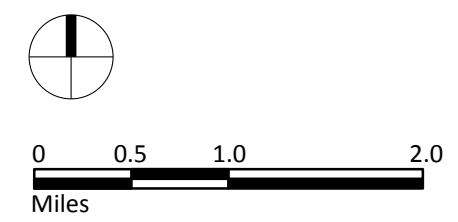
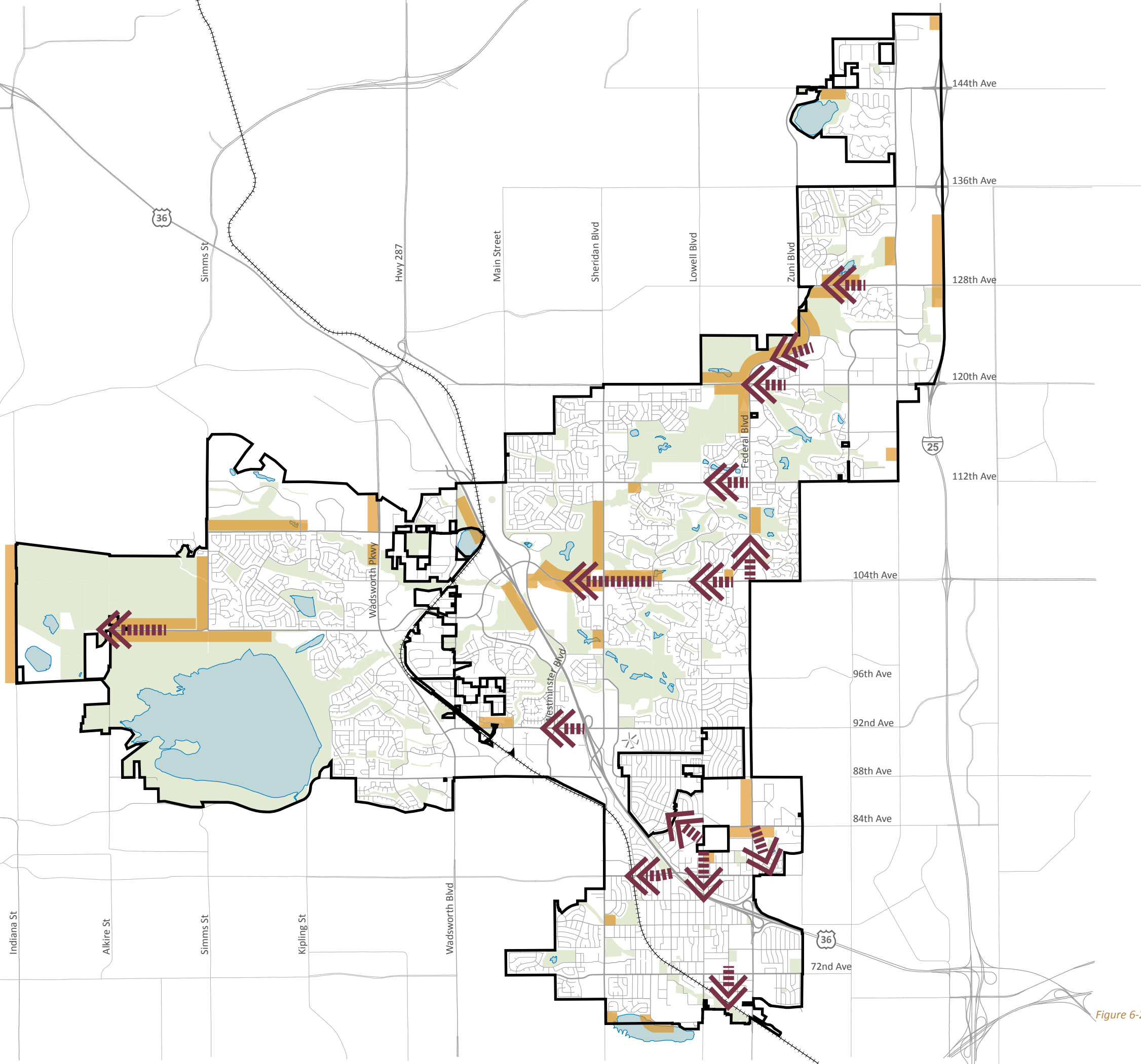
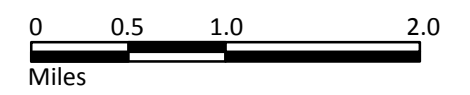
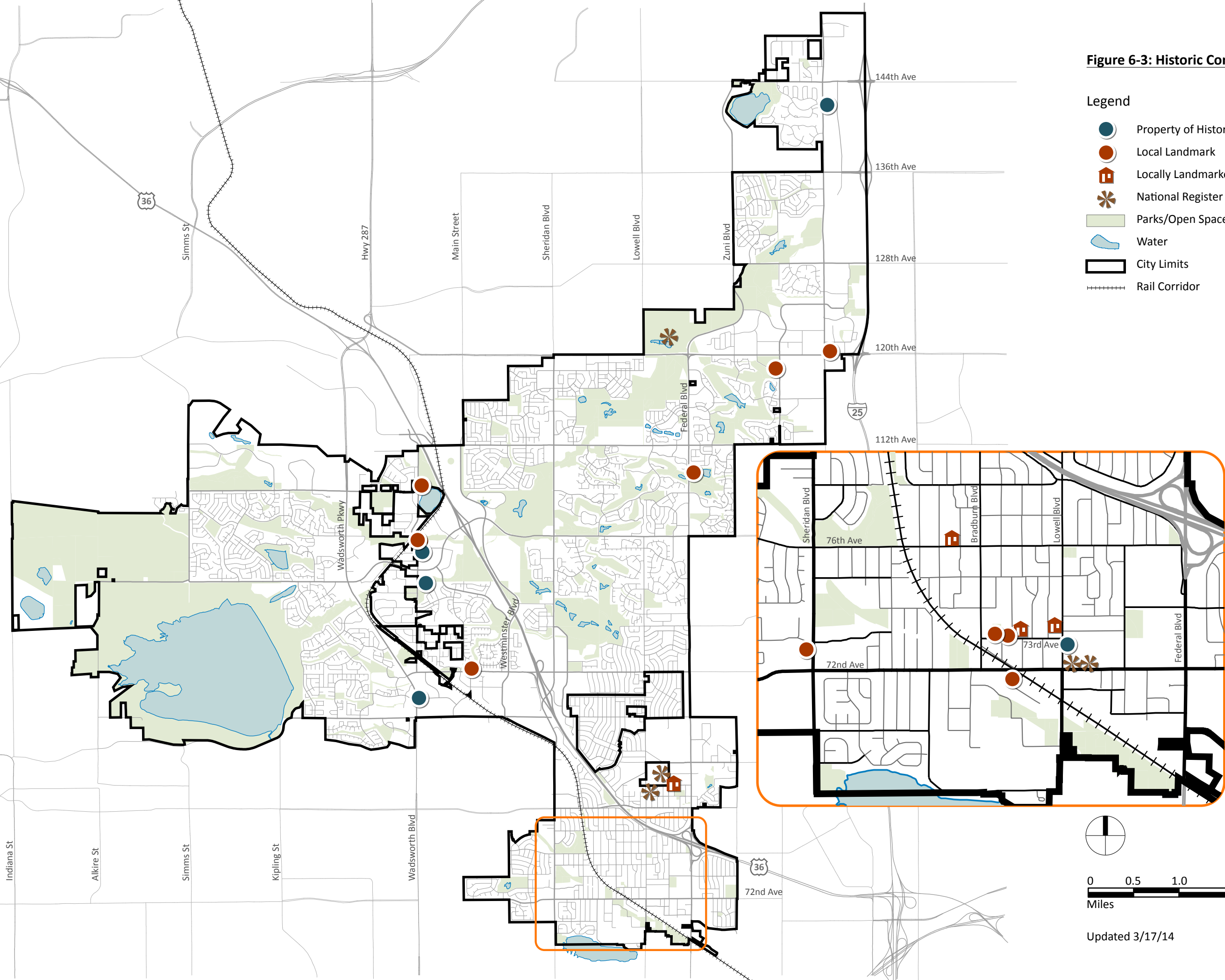


Figure 6-2: Views Updated 3/17/14

Figure 6-3: Historic Context

Legend

- Property of Historic Significance
- Local Landmark
- Locally Landmarked Residence
- National Register of Historic Places
- Parks/Open Space/Golf Courses
- Water
- City Limits
- Rail Corridor



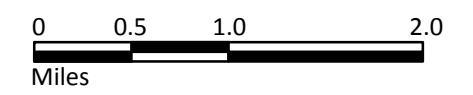
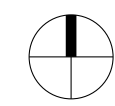
Updated 3/17/14

Figure 7-1: Parks, Libraries, Recreation & Open Space

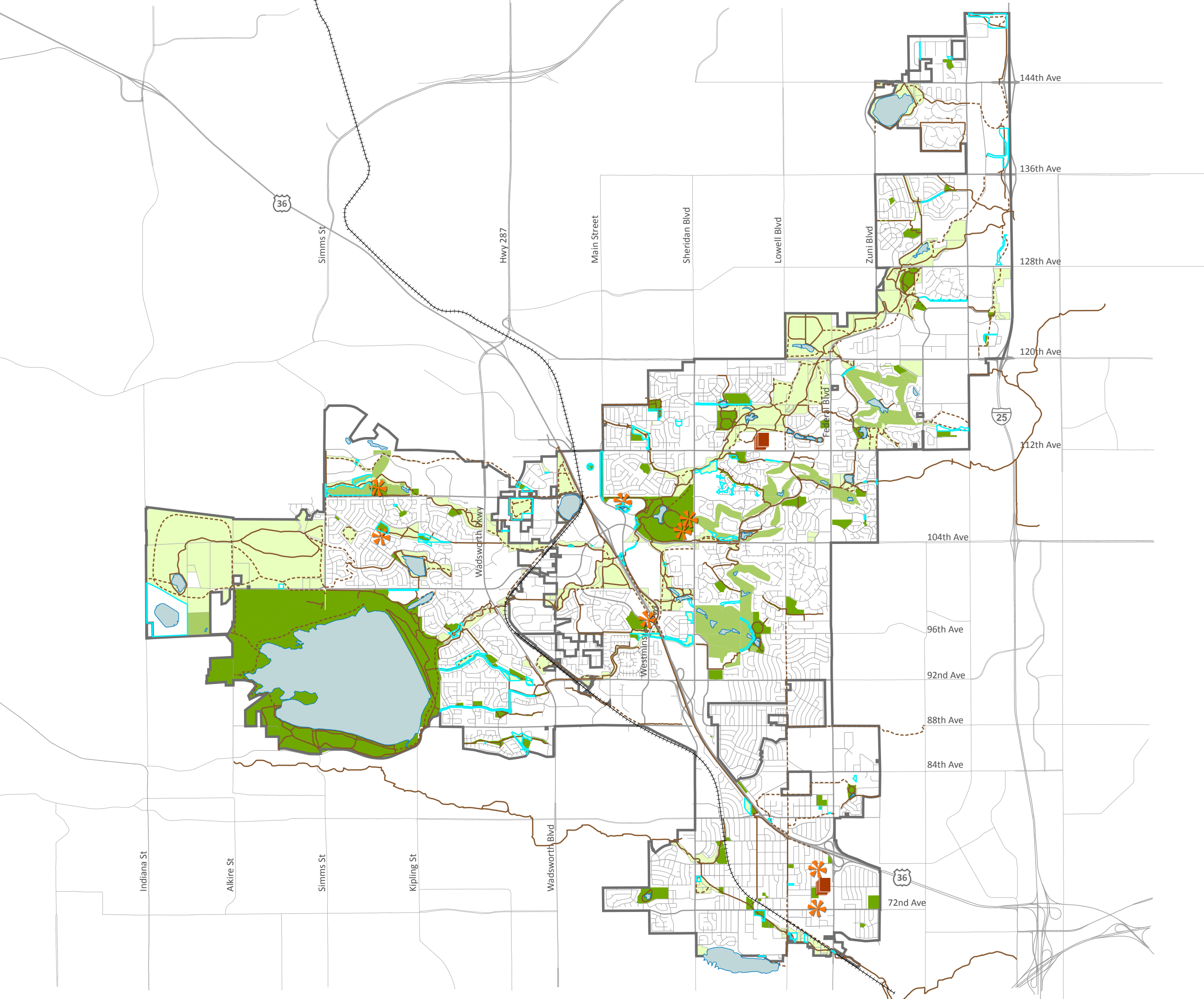
Legend

- Public Parks
- City Owned Open Space
- Golf Courses
- Existing Trails
- Proposed Trails
- City Owned Recreation Facility
- Library
- Water
- City Limits
- Rail Corridor

Updates 3/17/14



Updated 3/17/14





Existing Parks and Recreation

The city currently maintains and operates 53 neighborhood, community and citywide parks, ranging in size from 1.4 to 200 acres and comprising almost 600 acres in total. The city also owns 45 acres of undeveloped parkland. In addition to the city’s neighborhood and community parks, the city operates the 2,327-acre Standley Lake Regional Park and multiple recreation and sports facilities. Westminster’s Parks and Recreation Master Plan provides a complete inventory of the city’s parks and community facilities, which is summarized in Table 7-1. A major element of the city’s parks and recreation system is the programming of sports and activities for youth and adults. These programs include sports leagues, trips for seniors, swimming, arts and crafts, preschool and fitness programs.

Parks and community facilities are classified based on size, function and characteristics, as described in Table 7-2. Aside from the Standley Lake Regional Park, located at the western edge of the city, the majority of park space in the city is classified as neighborhood and community parks. These parks are an integral part of the city’s high quality of life and are utilized by approximately 75 percent of the city’s residents on a daily basis.



Existing parks include the regional Standley Lake Park, above, and neighborhood parks like Faversham Park, middle, and Bishop Park, bottom.

Table 7-1: Parks, Recreation and Open Space Inventory		
Facility Type	Quantity	Total Acreage
Parks	54	2919.4
<i>Neighborhood Parks</i>	45	259.5
<i>Community Parks*</i>	7	160.0
<i>Citywide Park</i>	1	205.0
<i>Regional Park</i>	1	2327.0
Undeveloped Parklands		45.3
Special Use Facilities	15	484.0
<i>Recreation Centers**</i>	5	30.0
<i>Sports Facilities</i>	2	10.0
<i>Golf Courses</i>	2	414.0
<i>Other Special Use***</i>	6	30.0
Conservation & Open Space		3013.672.1
<i>Subtotal Public Parks, Open Space and Golf Course Lands</i>		6,462.3
Non-City Owned Golf Courses	2	291
Total Parks, Open Space and Golf Course Lands		6,753.3811.8

*Includes the 205-acre City Park facility.

**City Park recreation and fitness facility acreage is included in the total 205-acre City Park acreage. An additional 11 acres is undeveloped at the Park Centre/Northeast Resource Center.

*** Refer to the City’s Parks and Recreation Master Plan for more detail.



7.3 OPEN SPACE AND TRAILS

Westminster's extensive open space system is a key element of its unique setting and identity as a Front Range community. The city has made preservation and protection of natural environments and habitats a priority, integrating their conservation into the physical development of the city. As a result, Westminster's visual landscape is rich with a variety of open spaces, trails, preserved historic sites and scenic vistas.

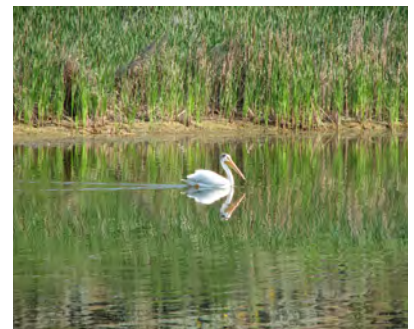
The city's extensive open space system began with authorization of an open space sales tax in 1985 to purchase land for preservation and natural habitat protection. Westminster was only the second city in Colorado to enact a sales tax for an open space acquisition program (after Boulder). As part of this effort, the city set a goal of preserving 15 percent of the city's overall land area as open space. With ~~almost~~ **over** 14 percent of the city's land area preserved as of 2013, the city has begun to transition efforts from acquisition to the development of an open space management and operations plan that will ensure this vital resource will be preserved and maintained into the future. A more limited open space acquisition program will still continue.

Existing Open Space and Trails

~~Over the past 28 years~~ Since 1985, the city has acquired 3,014~~72~~ acres of open space to be preserved for passive recreational use and protection of natural wildlife habitat. These open space areas can be found throughout the city, as shown in Figure 7-1, but are concentrated in the city's western area near Standley Lake and along drainage ways and irrigation ditches that cross the community, including Walnut Creek, Big Dry Creek, the Farmers' High Line Canal and Little Dry Creek. Preserved open space by creek and natural corridors is summarized in Table 7-3.

Existing open space in the city provides for protection of sensitive habitat areas and wildlife movement corridors, view corridors and preservation of open and rural landscapes. Additionally, the city's open space system provides recreation opportunities such as hiking, biking, fishing, horseback riding and nature study. Many of the city's open spaces are linear connections that follow major creek corridors or serve as buffers between developments. These linear connections allow for an extensive network of trails that play a vital role in the city, linking neighborhoods, parks, schools and employment areas to a citywide and regional trail system. In all, Westminster currently has over 100 miles of trails, as shown on Figure 7-1.

The city's open space and trail systems also connect to the larger regional system, particularly to the west of the city where vast areas of open space are preserved in the City of Boulder, Boulder County, Jefferson County and the Rocky Mountain National Wildlife Refuge.



The city's open spaces are a major asset for the community, providing trails (Big Dry Creek, top), wide open spaces for recreation and passive use (Hyland Ponds) as well as habitat for wildlife (Loon Lake, bottom).



Maintenance and improvements to the city's highly-used trail system will be a key focus of the open space program in the future.

Table 7-3: Preserved Open Space by Corridor

<i>Corridor</i>	<i>Acres</i>
Big Dry Creek	952.0 970.3
Little Dry Creek	76.3
Walnut Creek	187.2
Farmers' High Line and Niver Canals	135.9 147.7
Westminster Hills	1,029.2
McKay Lake	134.6
Hyland Ponds and South Hylands Creek	67.3 69.1
Wadsworth Wetlands	19.3
Vogel Pond	44.7
Natural Areas, Water, Trees & Wildlife	261.3 284.2
Other Areas	105.8 109.5
Total Preserved Open Space	3,013.3 3,672.1

Source: City of Westminster, October 2013.

Planned Improvements


Two master planning efforts serve the open space system—an Open Space Master Plan, which will be developed in 2014, and the city's Trails Master Plan. The Open Space Master Plan will be periodically updated and identify priorities for land acquisition and open space management. Future acquisitions will be limited and focused on protecting view sheds, preserving unique natural areas and purchasing properties that will improve trail access throughout the city. Enhancement of the city's open spaces will also be pursued including trail improvements and addition of educational areas in order to attract greater use of the system. However, maintenance and operations of the city's existing open space system will be the primary focus of future iterations of this plan, particularly as use of open space and trail facilities will only increase with the city's projected residential and employment population growth.

The Trails Master Plan identifies trails and connection points along the main trail corridors of Walnut Creek, Big Dry Creek, the Farmers' High Line Canal and Little Dry Creek. This plan was last updated in 2011 and provides a basis for trail connections in both open space and new development in the city. Almost 59 miles of new trail are proposed as part of this plan, as shown in Figure 7-1. These new trail alignments include completion of the Little Dry Creek Trail and other connections to facilitate the Refuge to Refuge Trail. Improvements to the open space and trails system are outlined in these master plans. This plan will be updated in 2014.

Figure 8-1: Public Facilities


Legend

Public Facilities


 City Hall and Public Safety Center

 Fire Station

Public Schools


 Elementary School

 Middle School

 High School

 Front Range Community College

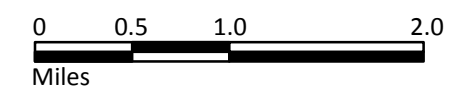
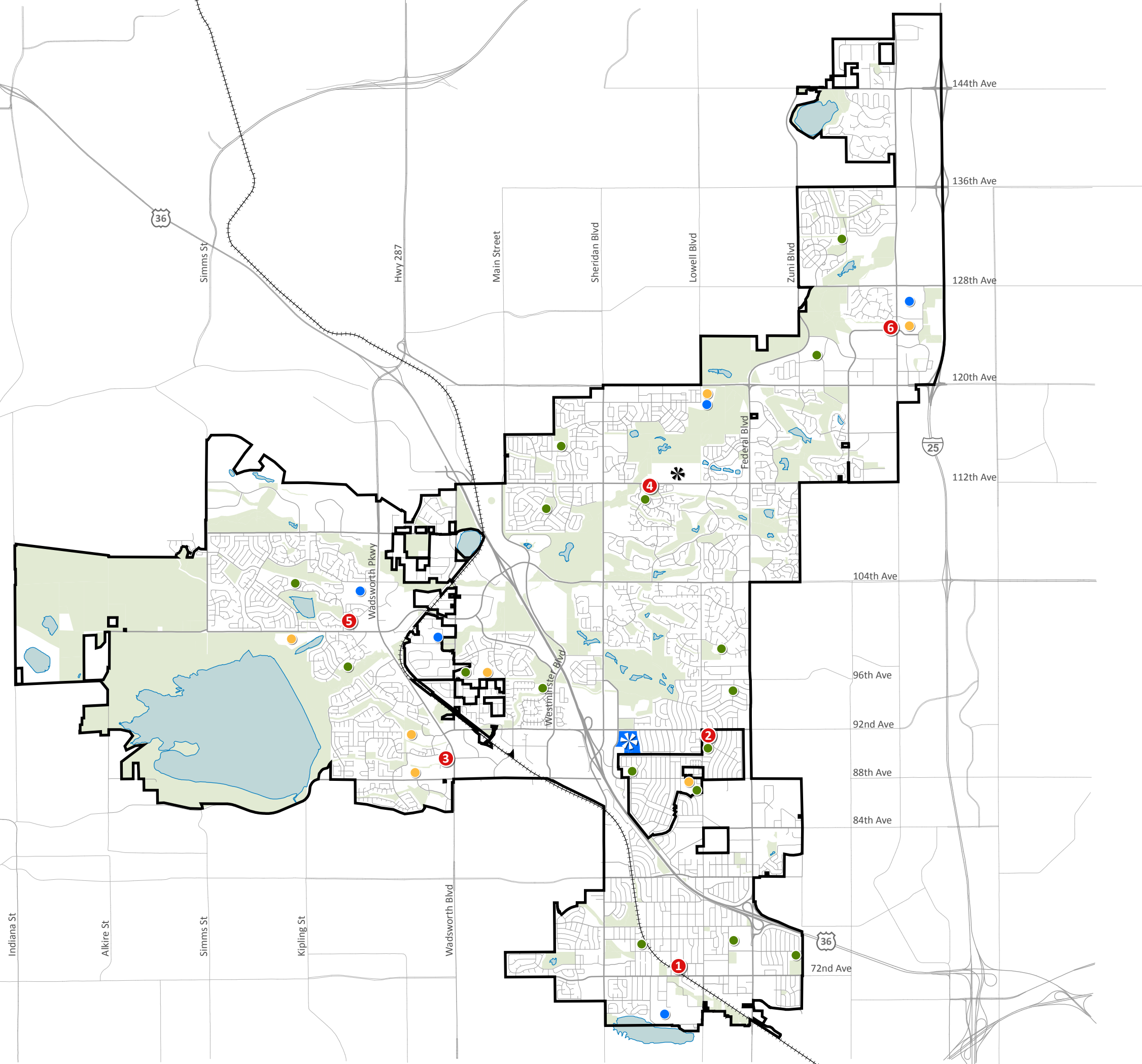
Planning Area

 Parks/Open Space/Golf Courses

 Water

 City Limits

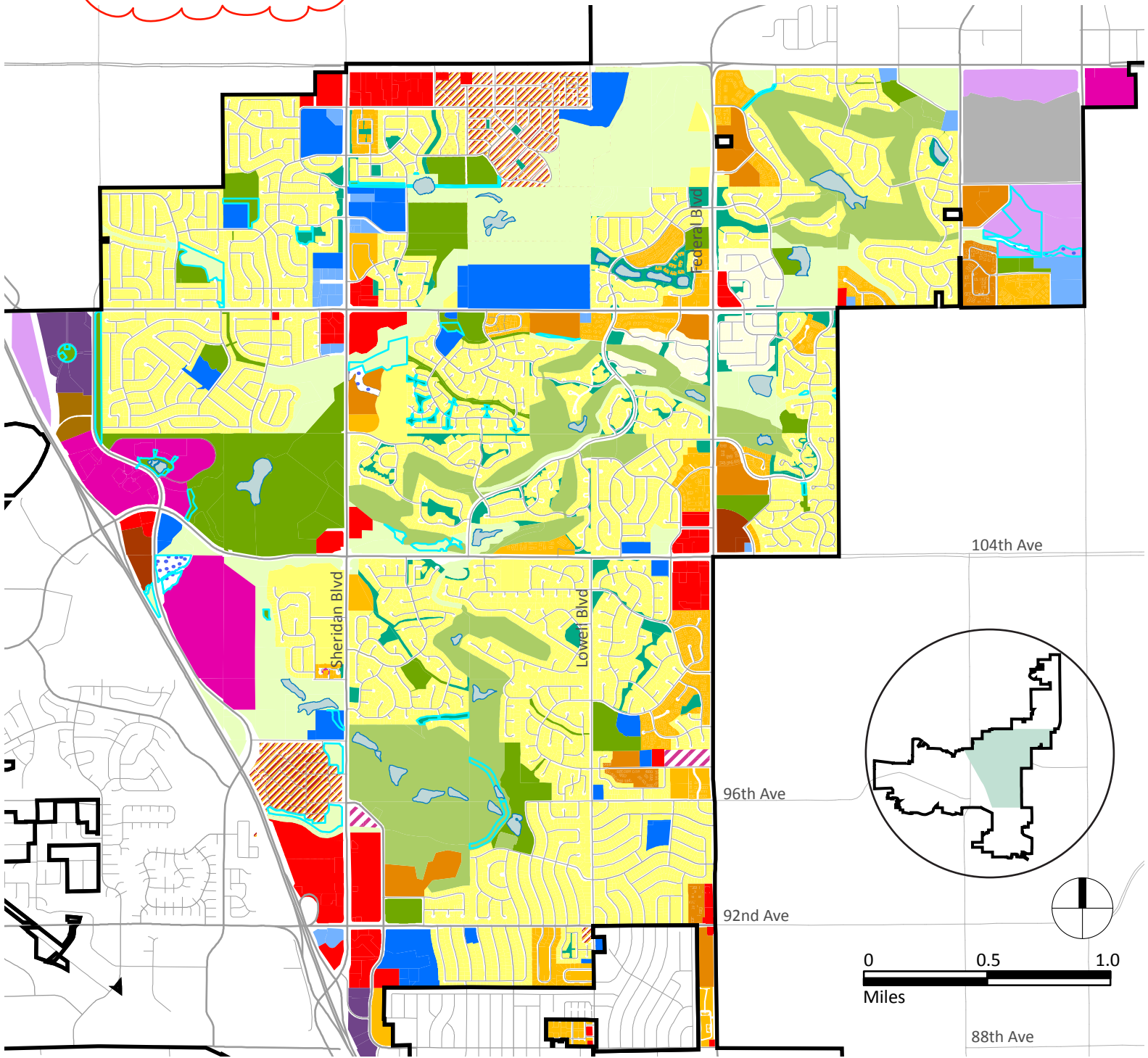
 Rail Corridor



























Updated 3/17/14

Updates 3/17/14

Figure C-1: Central Area Land Use Diagram

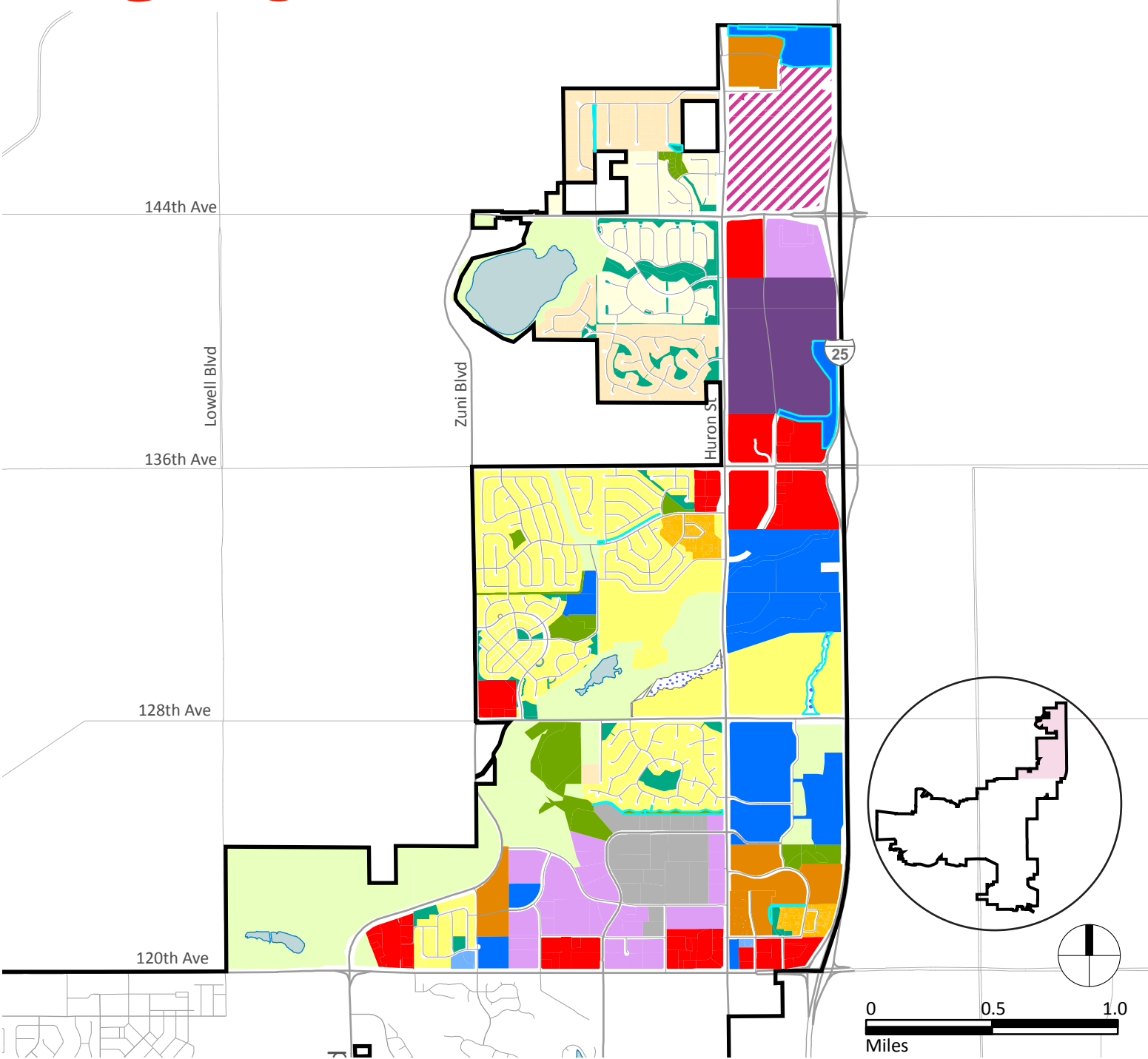


- | | | |
|--|---|---|
|  Residential R-1 |  Mixed Use |  Public/Quasi-Public |
|  Residential R-2.5 |  Mixed Use Center |  Public Parks |
|  Residential R-3.5 |  Retail Commercial |  City Owned Open Space |
|  Residential R-5 |  Service Commercial |  Golf Courses |
|  Residential R-8 |  Office |  Private Parks/Open Space |
|  Residential R-18 |  Office/R&D Low Intensity |  Major Creek Corridor on Non-Public Land |
|  Residential R-36 |  Office/R&D High Intensity |  City Limits |
|  TMUND |  Flex/Light Industrial |  Water |

Updated 3/17/14

Updates 3/17/14

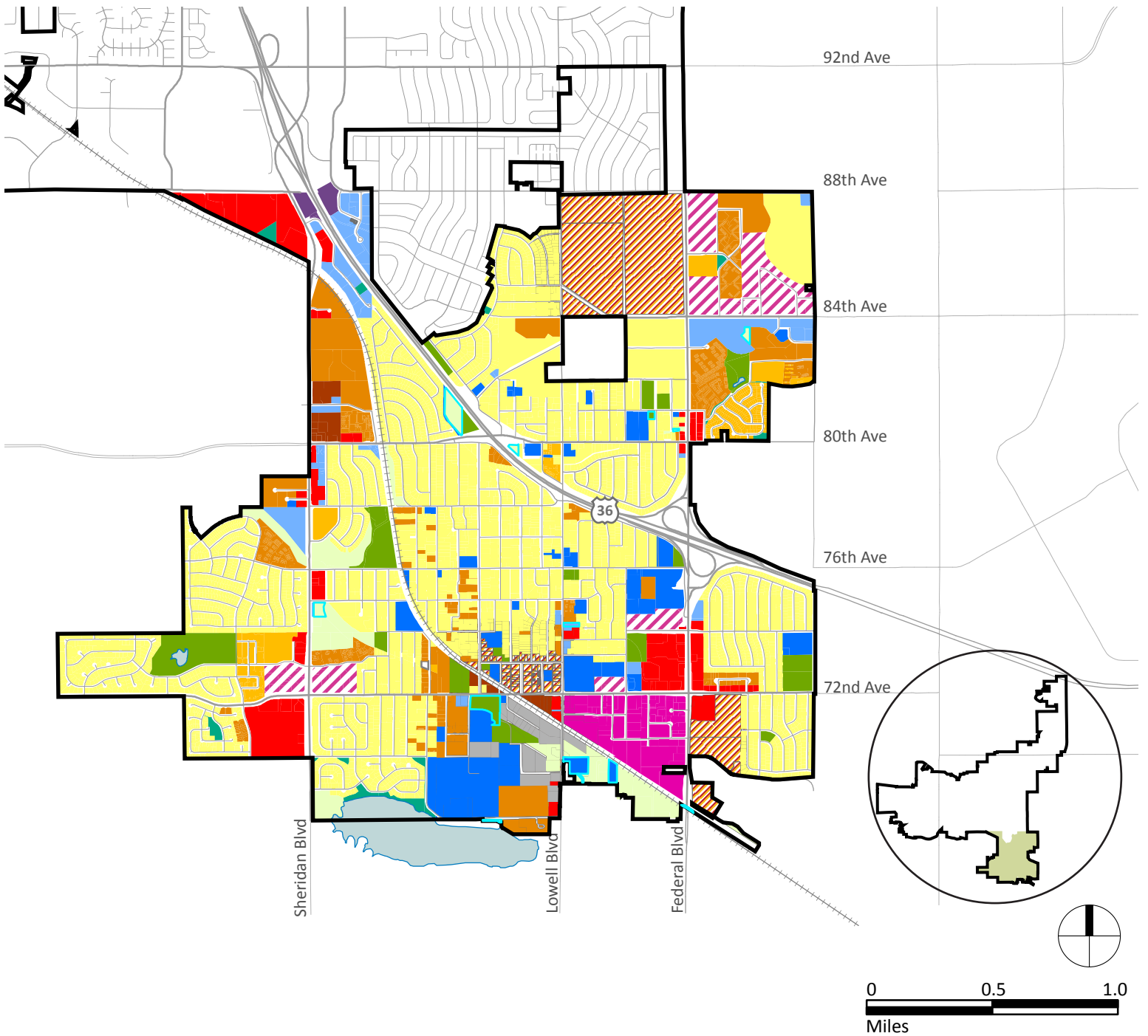
Figure C-2: Northeast Area Land Use Diagram



























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|--|-------------------|--|---------------------------|--|---|
| | Residential R-1 | | Mixed Use | | Public/Quasi-Public |
| | Residential R-2.5 | | Mixed Use Center | | Public Parks |
| | Residential R-3.5 | | Retail Commercial | | City Owned Open Space |
| | Residential R-5 | | Service Commercial | | Golf Courses |
| | Residential R-8 | | Office | | Private Parks/Open Space |
| | Residential R-18 | | Office/R&D Low Intensity | | Major Creek Corridor on Non-Public Land |
| | Residential R-36 | | Office/R&D High Intensity | | City Limits |
| | TMUND | | Flex/Light Industrial | | Water |

Updates 3/17/14

Figure C-3: Southeast Area Land Use Diagram

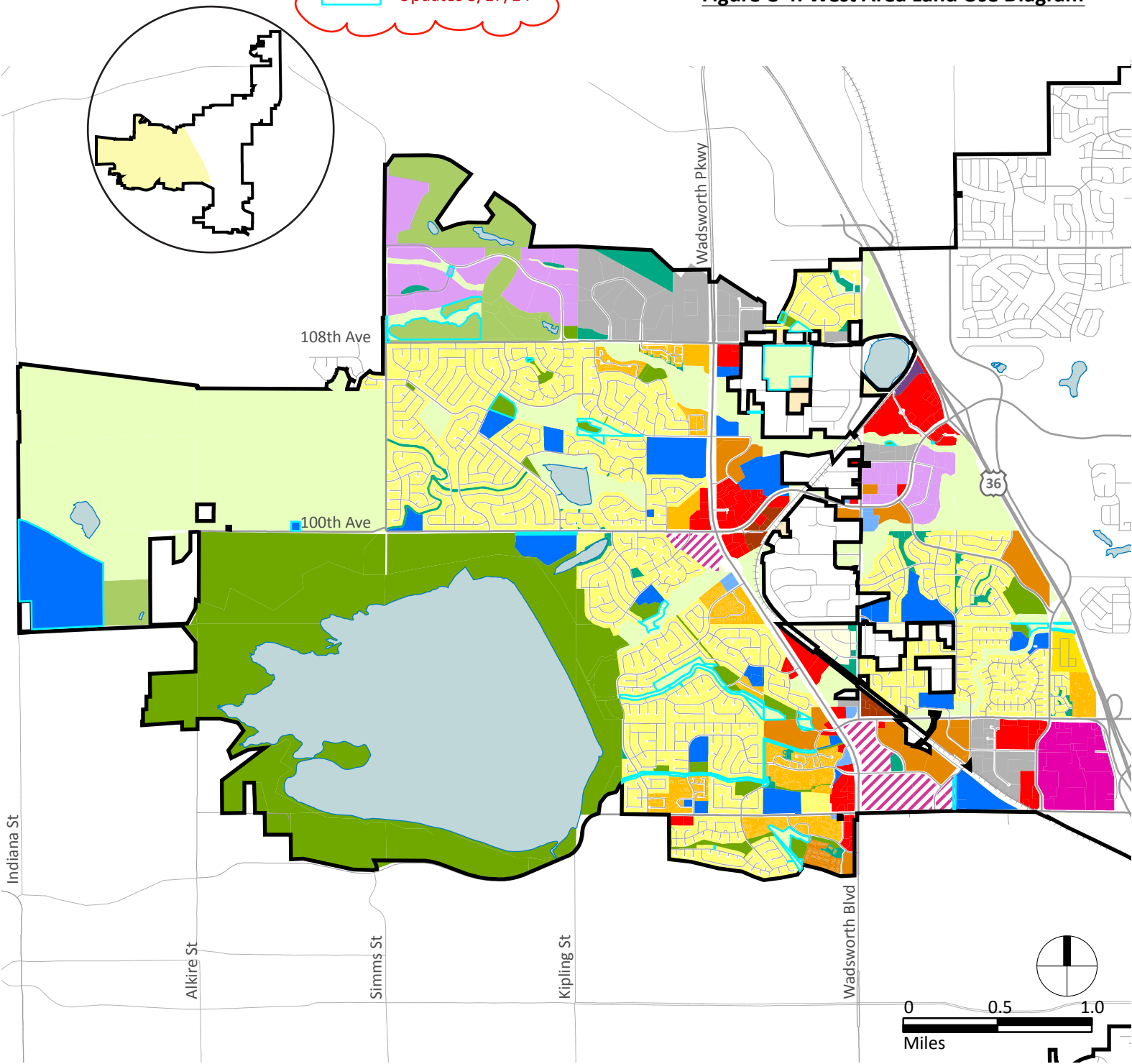


- | | | |
|--|---|---|
|  Residential R-1 |  Mixed Use |  Public/Quasi-Public |
|  Residential R-2.5 |  Mixed Use Center |  Public Parks |
|  Residential R-3.5 |  Retail Commercial |  City Owned Open Space |
|  Residential R-5 |  Service Commercial |  Golf Courses |
|  Residential R-8 |  Office |  Private Parks/Open Space |
|  Residential R-18 |  Office/R&D Low Intensity |  Major Creek Corridor on Non-Public Land |
|  Residential R-36 |  Office/R&D High Intensity |  City Limits |
|  TMUND |  Flex/Light Industrial |  Water |

Updated 3/17/14

Figure C-4: West Area Land Use Diagram

Updates 3/17/14



- | | | |
|-------------------|---------------------------|---|
| Residential R-1 | Mixed Use | Public/Quasi-Public |
| Residential R-2.5 | Mixed Use Center | Public Parks |
| Residential R-3.5 | Retail Commercial | City Owned Open Space |
| Residential R-5 | Service Commercial | Golf Courses |
| Residential R-8 | Office | Private Parks/Open Space |
| Residential R-18 | Office/R&D Low Intensity | Major Creek Corridor on Non-Public Land |
| Residential R-36 | Office/R&D High Intensity | City Limits |
| TMUND | Flex/Light Industrial | Water |

Updated 3/17/14



Staff Report

Information Only Staff Report
March 17, 2014



SUBJECT: 72nd Avenue/Raleigh Street Bridge Replacement—Construction Phasing

PREPARED BY: David W. Loseman, Assistant City Engineer

Summary Statement

The construction of the replacement of the structure carrying 72nd Avenue over Little Dry Creek at Raleigh Street is expected to begin in spring 2014 and will have a significant impact on local and regional traffic. Two options for the construction phasing of the work were discussed with the City Council during the Study Session on June 3, 2013, and Staff was directed to proceed with the option of a full closure of 72nd Avenue during eight months of the 16-month construction period for this project. Staff concurs that this approach is the more desirable method of conducting the work due to the fact that it minimizes the duration and disruption of the entire project. However, Staff is also aware that a full closure of 72nd Avenue in the vicinity of Raleigh Street is a potentially contentious issue for residents and business owners of the area, and the new members of the City Council should be advised of this previous decision. It is Staff's intent to follow the earlier direction on the construction phasing of this project unless instructed otherwise by Council.

Background Information

The construction of bridge and roadway improvements at 72nd Avenue and Raleigh Street is expected to start in spring 2014. The project consists of utility relocations, culvert removal, new bridge construction and reconstruction of the intersection three to four feet above its present elevation to improve hydraulic conditions and the utility of the regional trail that runs next to Little Dry Creek. The trail through the existing culvert at this location floods frequently during heavy rainfall events. Extensive water and sewer replacements in 72nd Avenue east and west of the intersection and in Raleigh Street south of the intersection are also planned at a total estimated construction cost of \$4.8 million (see attached project map).

The construction of the project will have significant impacts on local and regional traffic. As an important east-west commuter route, 72nd Avenue carries about 19,000 vehicles per day and also serves residential and business uses in the near-project area. The intersection is also a primary route for Adams County School District 50 (SD 50) bus traffic, SD 50 support service vehicles that operate out of a facility at 7002 Raleigh Street, the student population at Westminster High School and visitors to the future planned community recycling center. Approximately 80% of the trips to and from the SD 50 bus facility use the 72nd Avenue and Raleigh Street intersection, and generally, those trips are bound to/from an area north and east of the high school.

Several approaches to the construction of the project were studied. The two options that seem most feasible and illustrate the differences in approach to this complicated project are described here:

Option 1 is a fully-phased approach and would be designed for the contractor to maintain traffic on all streets in the area during construction with only occasional and necessary short-term closures or detours.

Closures of from one to six days might be needed several times during the project. 72nd Avenue would be reduced to one lane in each direction for most of the project, and short-term flagging (stoppage) would be relatively common. Raising the intersection three to four feet from its present elevation makes this a very challenging phasing task. Left turns from 72nd Avenue onto Raleigh Street could not be accommodated as a rule, so through-traffic is the primary beneficiary of this approach. SD 50 would need to reroute left turning buses to/from the bus facility, and the tight lane widths through the work area would be a challenge for right-turning buses. The overall duration of this “base case” approach to construction is estimated to be 22 months, and the estimated construction cost is approximately \$4.8 million.

Option 2 combines phased construction that would accommodate local and regional traffic at the beginning and ends of the project with a full closure of the intersection of 72nd and Raleigh in the middle of what is expected to be a 16-month project. The first phases would focus on the outlying utility work (Raleigh Street, Elk Drive, England Park and 72nd east of Bradburn Boulevard) that would generally be accomplished in the first six months while maintaining traffic on those streets and on 72nd Avenue (one-lane each direction). That would be followed by a complete closure of 72nd Avenue for six to eight months from just east of Stuart Street to Bradburn Boulevard to perform utility work in the closure area and demolish and reconstruct the bridge and roadway elements. A regional detour would be put in place during this time using 64th Avenue, 80th Avenue, Federal Boulevard and Sheridan Boulevard. The few property accesses that are within the closure area would be maintained, but primary access to the planned community recycling center will be cut off. The intersection would then be put back in service and another two months might be needed to complete the project. It is estimated that the reduced amount of construction traffic control costs and broad savings from the reduced duration of this option versus that of Option 1 would have a value of about \$400,000.

The two approaches are compared below.

	Option 1	Option 2
	Fully-Phased	Phased with Full Closure
Project Duration	22 Months	16 Months
Duration of Closures	Intermittent, several days each time	6 – 8 Months continuous
Ease of intersection reconstruction	Difficult	Relatively easy
Construction cost	\$4.8 million	\$4.4 million
Impact to SD 50 operations	Significant	Significant
Effect on 72 nd Ave businesses	Less than that of a full closure	Significant
Impact to regional traffic	Less than that of a full closure	Significant, but for reduced period
Impact to neighborhood	Significant, but less than a full closure	Significant

One further consideration that was raised by the City Council during the June 3 Study Session was that of construction worker safety. Council noted that Option 2 – the full closure of 72nd Avenue during

the most intense portion of the project – would provide a much safer work environment for the contractor’s personnel. The same could be said for motorists traveling through the work site at a time when much heavy equipment will be active in close proximity to the detour route.

Staff has had several meetings with SD 50 personnel to understand their operations and the impacts that the project may have. Their concerns include the extra time and costs associated with bus routes that would have to be modified to deal with work at the intersection. The number of times this would be necessary under Option 1 is expected to be more than with Option 2. The school district already has difficulty with delays at the signalized intersection of Lowell Boulevard/68th Avenue (operated by Adams County) during peak school traffic times, and they foresee similar difficulties at Lowell Boulevard/69th Avenue (a probable local detour for them). There are some mitigation measures that will be taken to reduce impacts to SD operations, including adjustments to the signal timing at Lowell Boulevard/68th Avenue and modifications to the parking lot east of the high school building to provide an alternative route to/from the bus facility. The school district is currently making these parking lot modifications. The student parking area northeast of the high school is also served primarily by Raleigh Street.

Either of the options will affect SD 50 operations in parts of two school years, and both options will have significant impacts on school district operations. While not committing to a preference, the SD 50 facilities staff saw Option 2 as the lesser of two evils if only for the reduced duration of the work.

The City will be constructing a community recycling center at the site of the abandoned England Water Treatment Plant in the near future. Primary access to the site is via Raleigh Street from 72nd Avenue with secondary access available through Elk Drive from Lowell Boulevard. Given that the center opening will result in the closing of the other drop-off locations, Staff does not recommend opening the center until complete access is available from Raleigh at 72nd Avenue. Staff will continue construction of the center and the drop-off locations will remain open until the center grand opening occurs approximately at the time of the completion of the bridge replacement.

Given the significant impacts to the local community, Staff will embark on a public information effort to inform the local residents and business owners. This effort will include mailing flyers, including project information and periodic updates on the City’s webpage and providing variable message boards during construction.

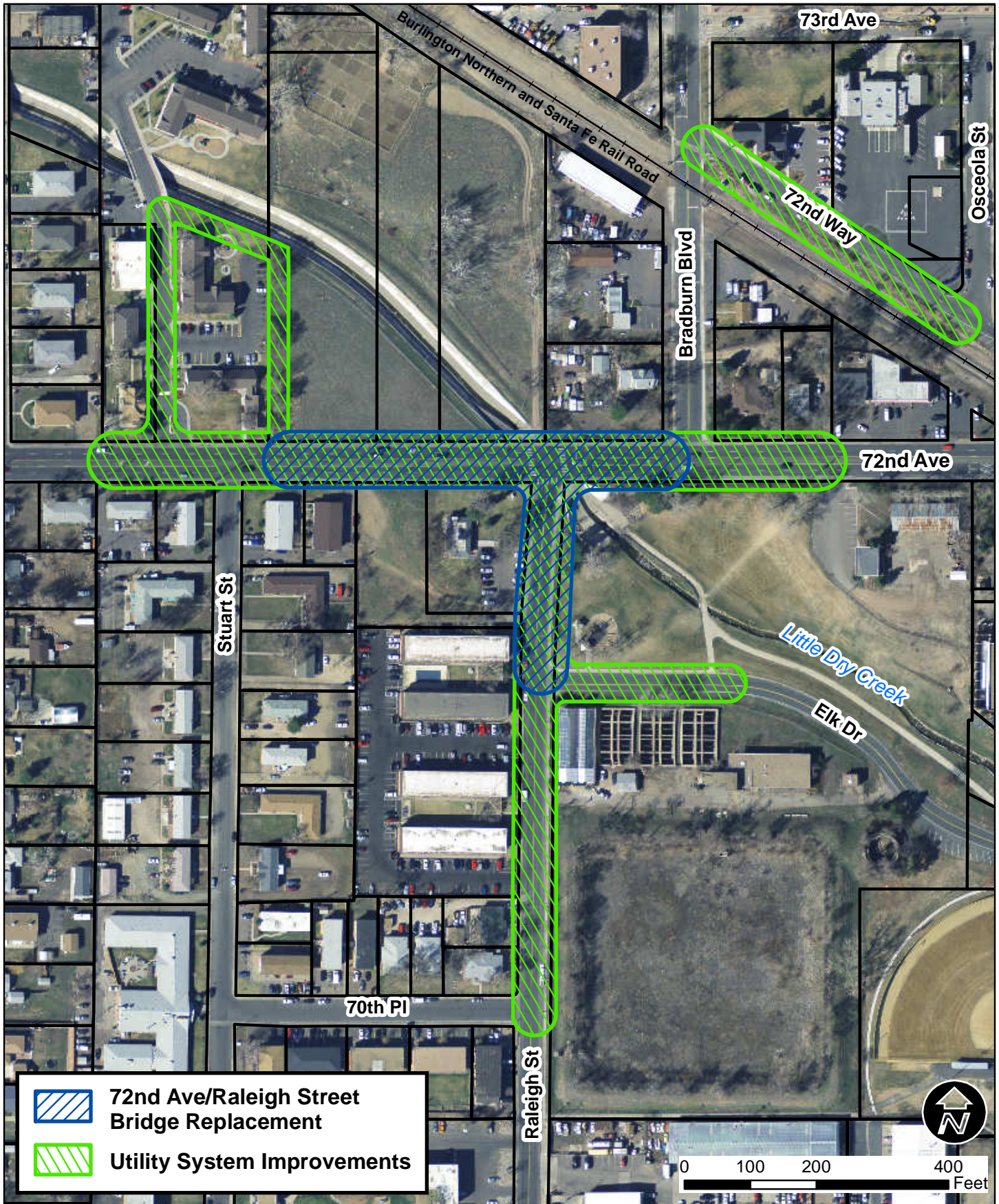
The reconstruction of a bridge at the Little Dry Creek crossing of 72nd Avenue supports the City’s Strategic Plan goals of maintaining a Financially Sustainable City Government with this investment in the City’s infrastructure as well as achieving Vibrant Neighborhoods In One Livable Community. Staff will proceed with the project under the Option 2 construction phasing scenario unless Council wishes to discuss this matter further.

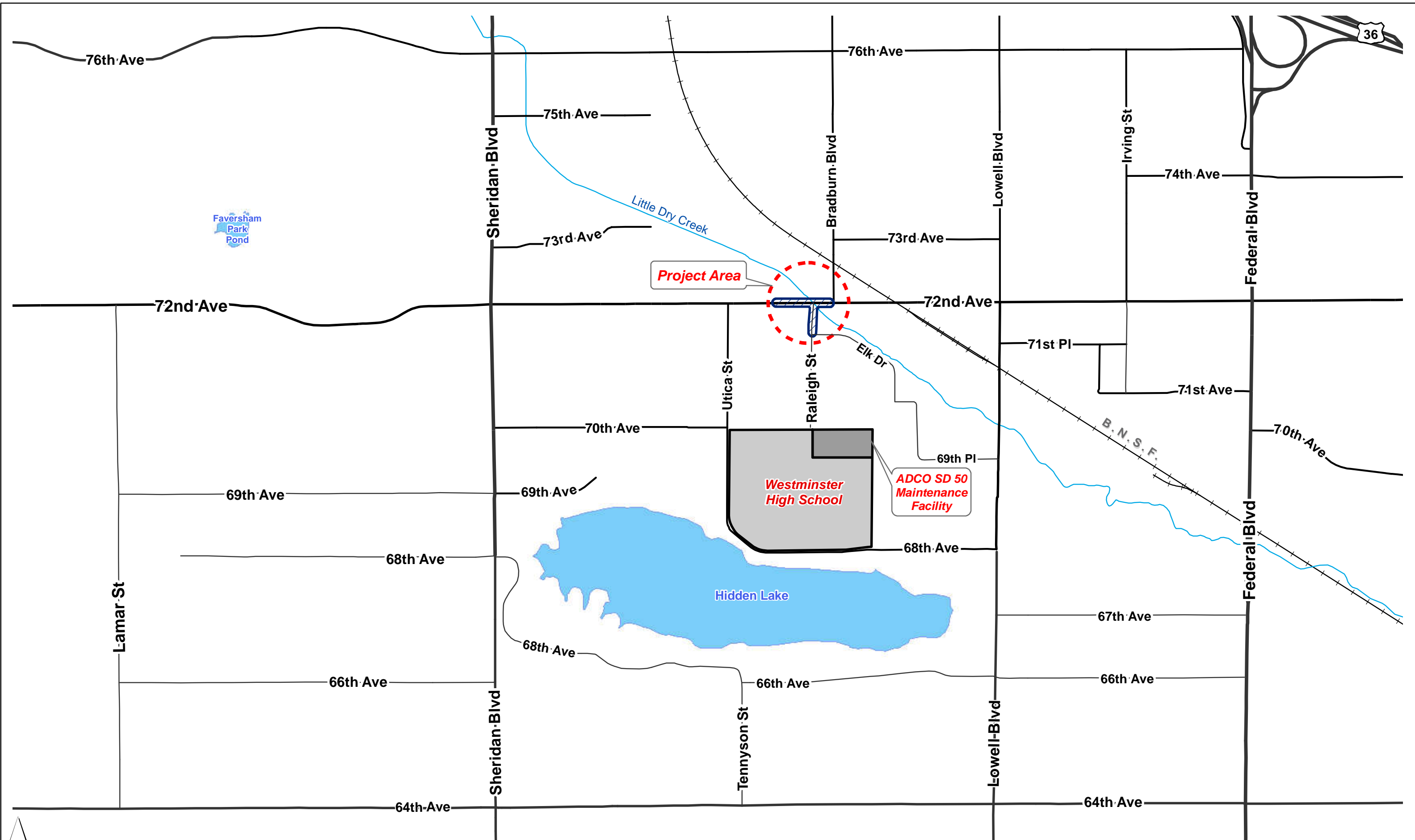
Respectfully submitted,

J. Brent McFall
City Manager

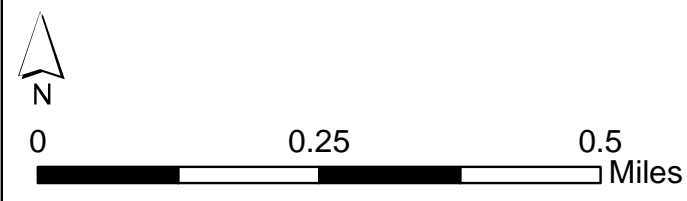
Attachments - Project Map
Vicinity Map

72nd Avenue/Raleigh Street -Project Area-





72nd Avenue/Raleigh Street Bridge Replacement Vicinity Map





WESTMINSTER

Staff Report

Information Only Staff Report
March 17, 2014



SUBJECT: Alternative Energy Fleet Study and Vehicle GPS System

PREPARED BY: Thomas Ochtera, Energy and Facilities Project Coordinator
Jeff Bowman, Fleet Manager
Matthew Booco, Fleet Specialist

Summary Statement

This report is for City Council information only and requires no action by City Council.

City Council expressed an interest in understanding the alternative energy opportunities Citywide, including our fleet vehicles. Because there are a number of alternative fueling and fuel efficiency technologies that may or may not be beneficial for the City to consider, an Alternative Energy Study was performed. This is an Information Only report on the results of that Alternative Energy Fleet Study and subsequent steps taken to mitigate our fuel consumption for City-owned vehicles.

Background Information

Through measures like the 2011 Fleet Optimization Study, Staff uses best practices to manage the City fleet. However, there are opportunities to further Council's strategic goal of Environmentally Sensitive City Operations. These opportunities could come in the form of alternative fuels such as: compressed natural gas (CNG), liquid propane gas (LPG), bio-fuels, electric vehicles (EV), and hybrid electric vehicles (HEV), for example. When considering these fuel types, additional consideration of particular duties of each vehicle must be considered. The range of vehicle and equipment types further challenges the alternative fuel investigation. Some vehicles are used for daily critical operations, such as the fire trucks and long hauling tandem-trucks for solid waste; while other vehicles, such as the car pool vehicles, skid steer or vacuum truck may only be used on a few occasions throughout the month. Finally, to fully explore the costs and benefits of any proposed alternative fuel, the infrastructure of fueling stations, varying vehicle maintenance protocols, and additional staff training must be considered.

Because of the complexity of variables and criticality that fleet vehicles play in all of the operations in the City, an outside company, specializing in alternative fuels for fleets, was hired to conduct the study. Antares Group was the third-party, competitively-bid firm selected to investigate the opportunities. More specifically, the alternative energy fleet study was conducted to understand the characteristics of the City of Westminster Fleet by class type, to identify the opportunities for alternative fuels and technologies toward more environmentally sensitive and efficient operations, and to recommend the most cost effective solutions to achieve fuel reduction savings.

The alternative energy fleet study is attached. It highlights several aspects of the fleet and its operations most notably:

- Technologies with the highest potential impact for their return on investment are hybrid electric, plug-in hybrid electric and idle reduction technologies.
- Alternative fuels such as hydrogen, CNG, LPG, and others are not currently recommended for their economic return.
- Many vehicles currently in the fleet are not meeting their expected efficiency. This is most likely due to idling. Most vehicle GPS systems can measure actual idle time.

The City has had an idling policy in place since 2007. This policy applies to all appropriate vehicles (emergency vehicles are exempt during an emergency incident) to reduce unnecessary idle time not related to effective work. While this policy is enforced in general, it is believed that a better job can be done to enforce this policy.

Much of the time, fuel use and the fuel efficiency of a vehicle depends on an individual driver's behaviors. Excessive idling, fast starts and stops, excessive speeds, and other factors add wear and tear on the vehicle, lessen the efficiency, and potentially can impact the safety of the driver and the other drivers on the road. A tool that will measure these factors, including idle time, is a first step toward better management of the fleet as a whole, as well as measure and report on idle time for individual vehicles. Once driver behaviors are identified, other fuel saving technologies can be further evaluated and implemented. The first step is to gather, measure, and report the information.

A Fleet Global Positioning System (GPS) system has hardware and software components. The hardware is installed on each vehicle and monitors several functions of the vehicle including the internal diagnostic reporting integrated into the vehicle's onboard computer. This data is then sent to the internet where City staff can receive reports on vehicles, generate work orders, and other functions. In addition, vehicle function can be monitored in near real-time by designated staff in each department. For this reporting and monitoring service, there is a monthly service fee per vehicle.

Given the recommendations from the alternative fleet fuel study, Staff investigated the existing technologies related to Fleet GPS systems. This was a collaborative process involving appointed members from every department that operates fleet vehicles. As a result of this investigation, additional opportunities to better record the pre and post inspection requirements as mandated by the Department of Transportation for commercial vehicles were also recognized. These mandated pre and post driving inspections are currently completed on paper. The new GPS system will automate the inspection process and interface with the Fleet Maintenance preventative maintenance program to streamline the ordering of parts and other tasks related to maintaining the equipment in a safe manner. The GPS offerings of several vendors were competitively bid to determine the best price for a product that meets all of our needs. In addition, Staff is working closely with the Regional Air Quality Council (RAQC) toward grants that will offset up to eighty percent of the installation costs for a GPS system.

It is believed that simply installing the GPS vehicle monitoring system while informing City staff of the new equipment will lead to more conscientious driving, less idling, and a better understanding of our use of these resources. This will further Council's strategic goals of Financially Sustainable City Government Providing Exceptional Services, Vibrant Neighborhoods in one Livable Community, and Beautiful and Environmentally Sensitive City operations.

Respectfully submitted,

J. Brent McFall
City Manager

Attachment

Alternative Energy Fleet Assessment

Final Report



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EXECUTIVE SUMMARY

This alternative energy fleet assessment was completed for the City of Westminster to evaluate the current vehicle assets and identify priorities, costs, timing and key performance indicators for alternative fuels and advanced transportation technologies, in order to estimate maximum economic benefits. The evaluation used on-road vehicle data provided by the city to identify and assess the current efficiency and performance of the fleet. Summaries were included for various alternative fuel and advanced transportation technologies including biodiesel, ethanol, natural gas, propane, electricity, hydrogen, dimethyl ether, hybrid electric vehicles, hydraulic hybrid vehicles, and idle reduction technologies. The success of these strategies is based on a number of factors, including vehicle type and quantity, utilization levels, annual fuel consumption, fuel costs, and geographical location.

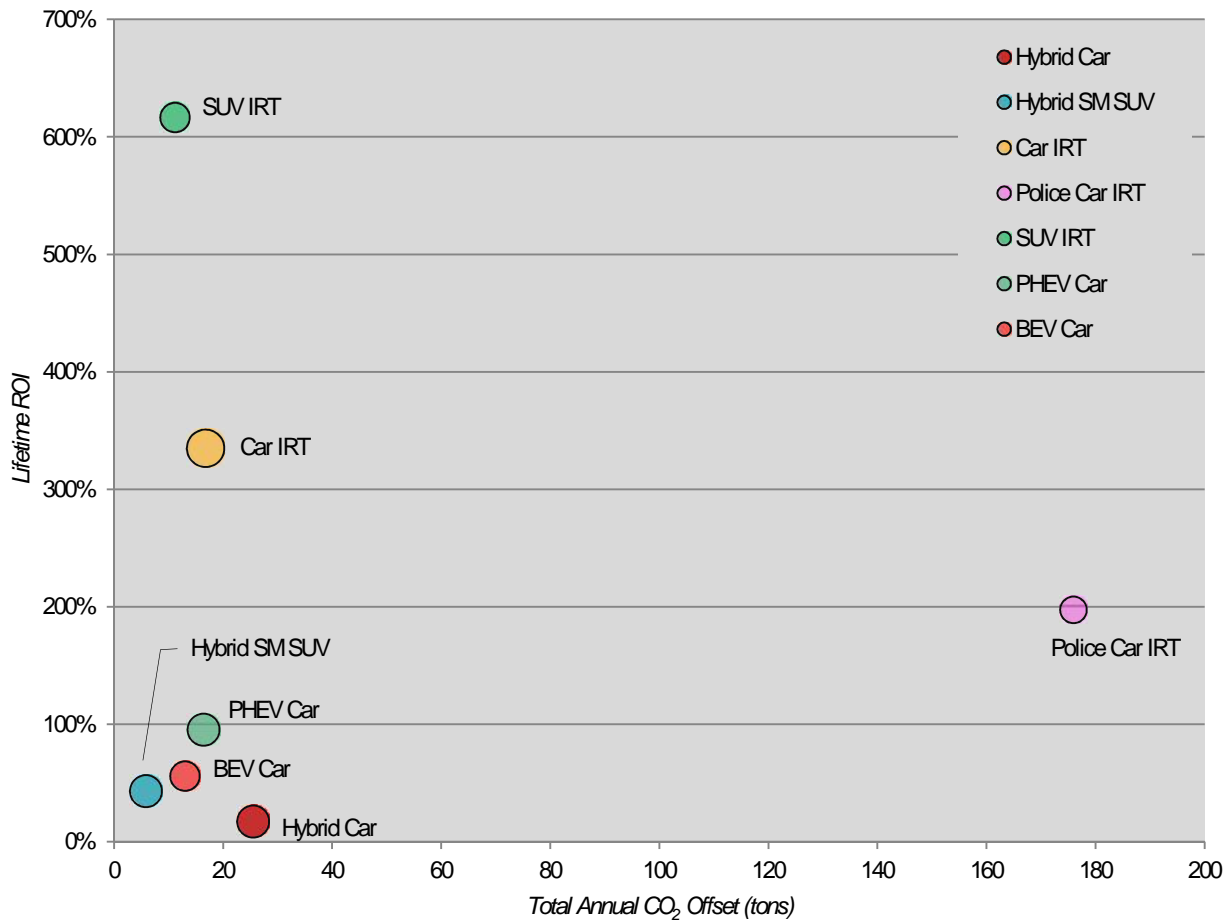
After reviewing the current vehicle operations for the City of Westminster, technologies with highest potential for economic benefit were identified as hybrid electric, plug-in hybrid electric, and idle reduction technologies. Other alternative fuel and advanced technology solutions that are not currently good options for the City based on the operational characteristics and current market costs were briefly analyzed, as these may prove viable in the future if conventional fuel prices should increase or further fleet consolidation increase the per vehicle utilization.

Hybrid Electric Vehicles (HEVs) can be used for a variety of operations within the fleet and provide varying levels of savings depending on vehicle usage. The application of hybrid electric technology must be evaluated on an individual vehicle basis, as a relatively high level of utilization is necessary to justify the higher incremental costs. Hybrid cars and hybrid small sport utility vehicles (SUVs) showed some potential for hybrid technology for the heavily utilized vehicles while large SUVs and half-ton pickups show limited benefits under current operations.

Battery electric vehicles (BEVs) provide 100% electric transportation without the use of any petroleum fuel while plug-in hybrid electric vehicles (PHEVs) offer a limited all electric range with the ability to operate as a hybrid once the onboard batteries are depleted. While these vehicles typically have a relatively high initial cost and require charging infrastructure to be installed at an additional cost, the Charge Ahead Colorado program, implemented by Clean Air Fleets, provides funding to offset up to 80% of the incremental cost of plug-in electric vehicles (PEVs) and electric vehicle charging infrastructure. The economic incentives available to the City of Westminster for these vehicles makes this type of vehicle cheaper than conventional hybrid cars and results in significantly lower payback periods. Without the incentive, PEVs would not be economically beneficial for the City.

The potential for idle reduction technology within the fleet was also evaluated for a range of vehicle and technology types. Potential technologies for this fleet could include start-stop systems and various battery based auxiliary power unit systems. Ideal applications for this technology are patrol (police) cars, patrol SUVs, and passenger cars. Police vehicles were identified as the application with the most potential for this technology as they are perceived to experience significant idling periods throughout the day and require relatively low power draw during these idling periods. Idle reduction technology may also be applicable for some heavy-duty vehicles, however, the potential benefit could not be easily determined and technology limitations may limit the overall viability for this application.

The potential for carbon dioxide (CO₂) emission reduction and return on investment (ROI) for various technologies and applications examined in this assessment are shown in the following graphic. The data presented here is only for the vehicles and technologies that are deemed viable for the City of Westminster’s Fleet and that have the potential to provide a ROI within their life.



Based on the results of this study, it is recommended that the city pursue the following fleet management strategies, alternative fuels, and advanced transportation technologies;

1. **Vehicle utilization monitoring via GPS.** To more accurately estimate the potential benefits of the other recommendations listed below and to quantify the benefits realized from implementing a fleet solution, a better method for monitoring vehicle utilization is needed. GPS tracking of each vehicle would show the duration, timing, and characteristics of each trip, allowing an analysis to determine the impact and benefit of each proposed or implemented solution.
2. **Fleet right sizing and vehicle right typing.** Many vehicles in the fleet appear to be underutilized and there is likely an opportunity to use smaller and more fuel efficient vehicles. GPS technology may be necessary to identify opportunities to pool or share vehicles among various divisions. With higher per vehicle utilization, the business case for alternative fuels and advanced transportation technologies improves.

3. **Idle reduction.** Based on the available data, many vehicles are not achieving their expected efficiency. This is most likely due to idling. Much of the benefit shown by hybrid electric vehicles may be due to the elimination of idling. GPS technology could be used to verify this conclusion. If idling is a significant issue, a no idling policy or idle reduction technology would result in a good return on investment for the City.
4. **Plug-in electric vehicle technology for select passenger vehicles.** The city must first determine which fleet vehicles have regular routes that would utilize most of the electric capacity of a plug-in electric vehicle (plug-in hybrid electric or battery electric) and spend sufficient time at a location where a charging station could be installed with minimal electrical work. If appropriate plug-in electric vehicle models can be procured and the City gets accepted for an award under the Charge Ahead Colorado program, then plug-in electric vehicles will be economically viable.
5. **Hybrid electric technology for select high mileage passenger vehicles.** This technology is easy to implement into the fleet, as it has already been done for some vehicles, and is economically viable for vehicles that are driven frequently. Pooling or sharing vehicles to increase the utilization per unit would help justify the investment into hybrid electric technology, but the successful implementation of idle reduction technology or a no idling policy would likely be more cost effective if successful.

BASELINE SUMMARIES

Summaries of fleet vehicle operations were created to establish a baseline. These are used to identify areas for potential improvement and determine which vehicle groupings have the largest overall impact on fuel consumption. Summaries were completed for the overall fleet based on vehicle type and division, as well as individually for the seven high-level divisions. The following summaries include data from all on road vehicles in the fleet with the exception of one bus that was eliminated due to very limited use and low efficiency. Accompanying descriptions state the assumptions and data processing approaches used for developing each summary, while also highlighting key observations. The overall fleet vehicle utilization, fuel consumption, efficiency, and operational profiles are based entirely on data provided by the City of Westminster for the purpose of this study. Vehicle data was provided on an annual basis (2012 data was used throughout this analysis). Specific summary parameters include:

- **Count** is the total number of vehicles included in a specific division/vehicle group
- **Age** is the average age of all vehicles in a group
- **Total miles per year** is the sum of per unit miles
- **Unit miles per year** is the average of miles for each vehicle
- **Total gallons per year** is the sum of per unit annual fuel usage
- **Unit gallons per year** is the average of per unit annual fuel usage
- **Miles per gallon** is the average of fuel economy data
- **Maintenance and Repair (M&R) cost per mile** is the sum of the annual maintenance and repair costs divided by miles per year
- **Fuel cost per mile** is the average annual fuel use multiplied by fuel cost divided by miles per year
- **Total cost per mile** is the sum of the M&R and fuel cost per mile

To effectively evaluate the potential for using alternative fuels and advanced transportation technologies both today and in the near future, the trends in fuel use and cost were analyzed. Future fuel costs, for both gasoline and diesel fuel are based on published data, but scaled for the lower fuel cost seen in Colorado compared to the national average. The predicted fuel costs for Westminster from 2010-2040 are shown in Figure 1.¹

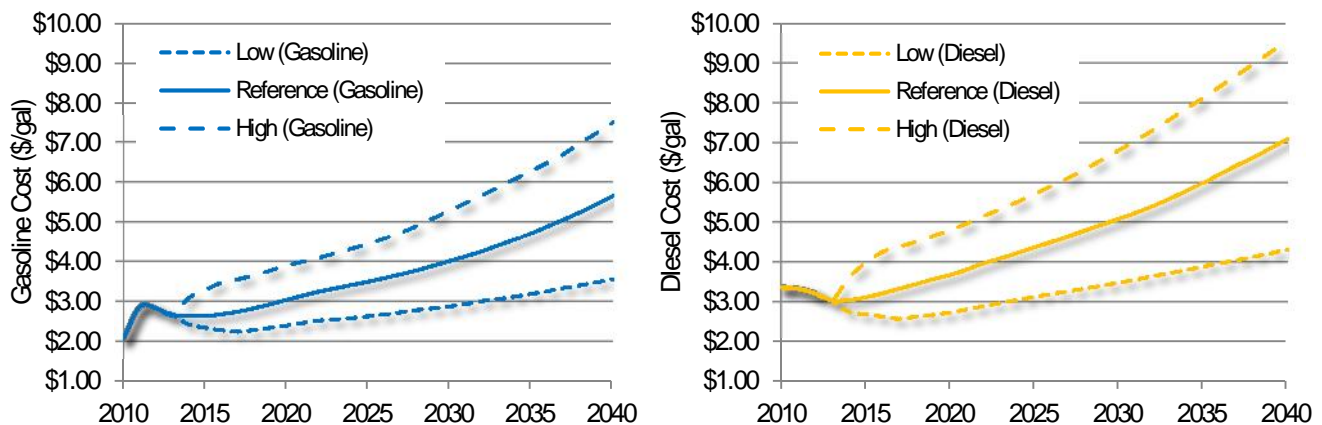


Figure 1: Gasoline and Diesel Fuel Cost Predictions

¹ Annual Energy Outlook 2013. U.S. Energy Information Administration. Retrieved October 28, 2013, from http://www.eia.gov/forecasts/aeo/source_oil.cfm

Historic fuel trend data, incorporating fuel quantity and cost, for both diesel and gasoline, was provided by the City of Westminster for years 2002 through 2013 (however, 2013 usage data is not a full year and was not used). Based on this historic data, average annual fuel use increase over the past 10 years was calculated at 0.3% annually for gasoline and 0.7% annually for diesel fuel (average for the entire fleet was 0.5%). Fuel use increase trends varied from year to year and scenarios with fuel use trends assumed to be lower (-1.5% annually) and higher (2.5% annually) were also evaluated. This data was then multiplied by the EIA fuel cost data (shown in Figure 1) to result in the potential total fuel cost trends that could be seen by the City of Westminster in the future. The overall historic and projected future fuel costs (estimated out to 10 years in the future) are shown in Figure 2.

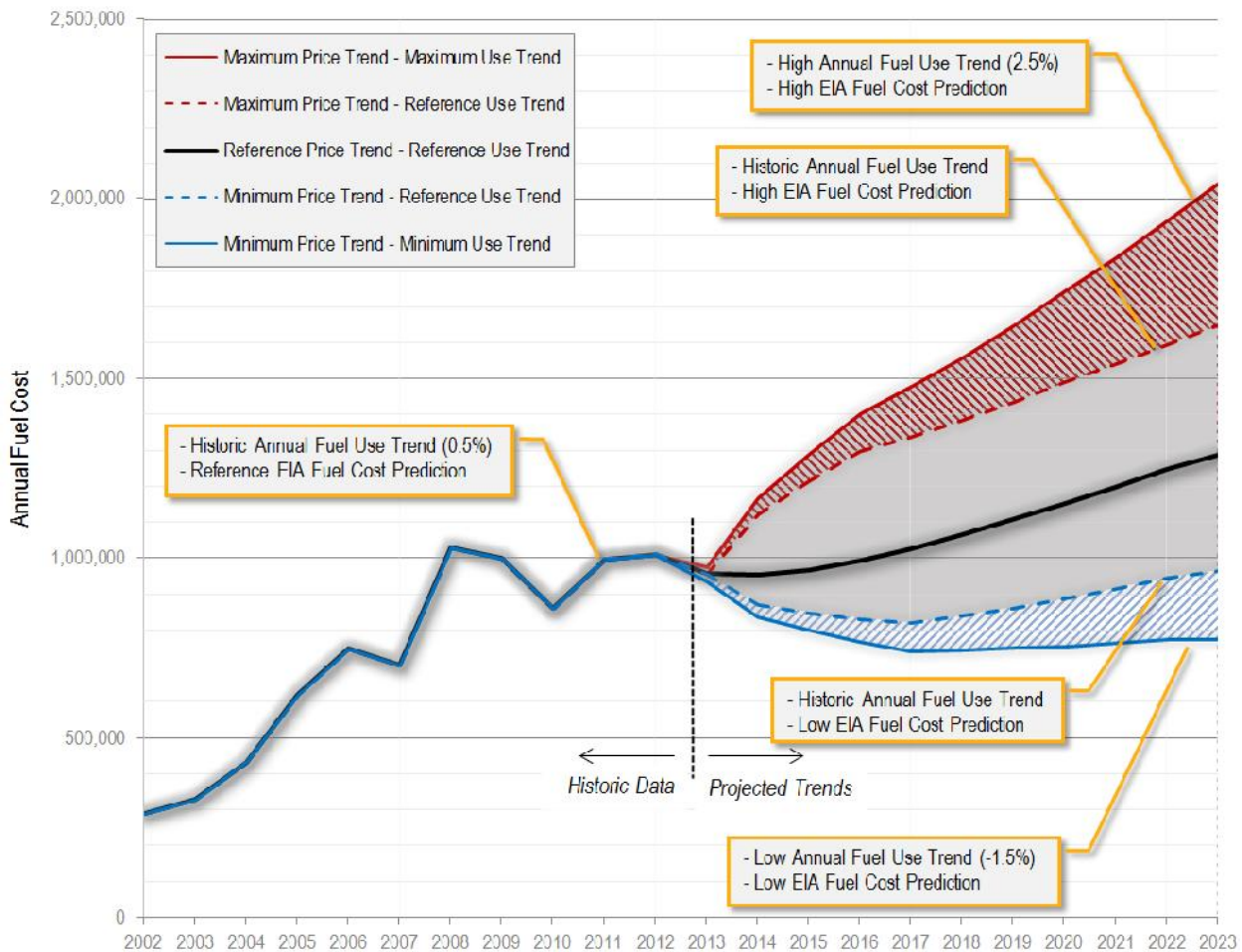
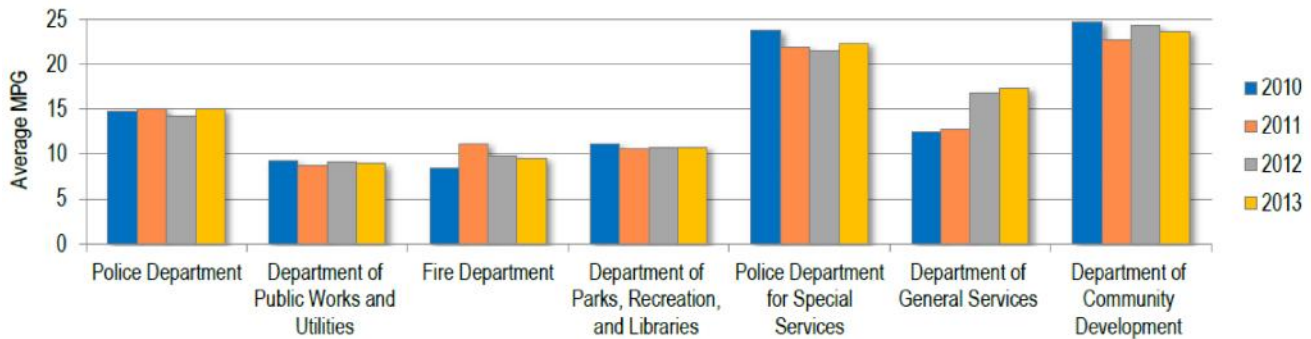


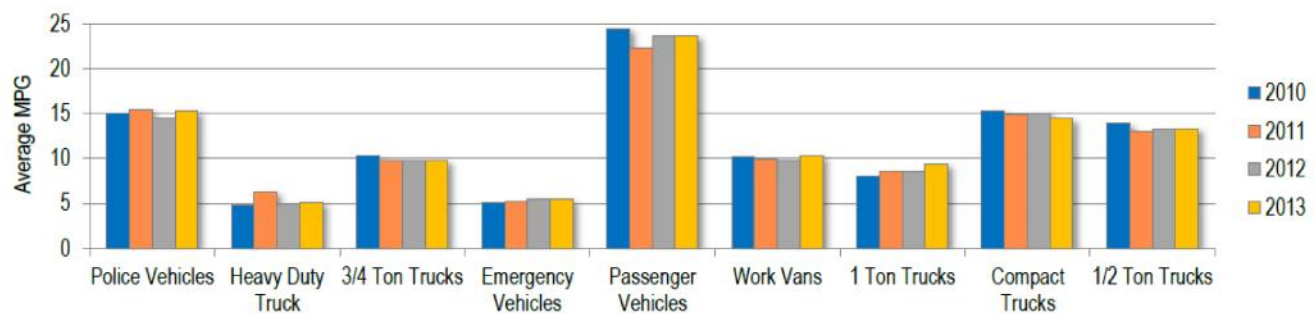
Figure 2: The City of Westminster Operational Cost Data

Total On Road Fleet and Division Fleet charts and graphs below include all on road vehicles operated by the City of Westminster. Annual operational data for all heavy duty (HD) on road and Fire Apparatus vehicle groups was provided as hourly data which was converted to equivalent miles based on a multiplication factor calculated by dividing the vehicle odometer reading by total hours recorded over vehicle life. Police vehicles are the highest fuel users at 35%, followed by heavy duty trucks (18%), ¾ ton trucks (14%), and emergency vehicles (14%).

	Count	Age	Total Miles per Year	Unit Miles per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
Police Department	81	4.0	1,355,793	16,738	110,650	1,366	14.2	\$0.20	\$0.23	\$0.43
Public Works and Utilities	84	7.4	473,914	5,642	78,572	935	9.1	\$0.55	\$0.51	\$1.06
Fire Department	32	6.9	308,374	9,637	48,278	1,509	9.8	\$0.66	\$0.50	\$1.15
Parks, Recreation, and Libraries	55	8.1	362,622	6,593	34,134	621	10.7	\$0.24	\$0.27	\$0.51
Police Department for Special Services	49	7.6	356,164	7,269	19,539	399	21.5	\$0.12	\$0.15	\$0.27
General Services	19	6.3	102,815	5,411	7,607	400	16.8	\$0.14	\$0.21	\$0.35
Community Development	16	6.0	114,487	7,155	6,238	390	24.3	\$0.15	\$0.15	\$0.30
Total or Average	336	6.5	3,074,168	9,122	305,019	905	13.8	\$0.29	\$0.29	\$0.58



	Count	Age	Total Miles per Year	Unit Miles per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
Police Vehicles	72	3.2	1,294,993	17,986	104,273	1,448	14.5	\$0.19	\$0.23	\$0.42
Heavy Duty Truck	39	8.2	231,893	5,946	52,646	1,350	4.9	\$0.96	\$0.73	\$1.69
¾ Ton Trucks	56	6.6	420,700	7,512	43,341	774	9.7	\$0.18	\$0.29	\$0.48
Emergency Vehicles	18	6.2	229,484	12,749	43,069	2,393	5.5	\$0.81	\$0.60	\$1.42
Passenger Vehicles	78	7.3	477,733	6,125	22,901	294	23.6	\$0.13	\$0.14	\$0.26
Work Vans	22	8.9	166,514	7,569	16,390	745	9.8	\$0.22	\$0.28	\$0.50
1 Ton Trucks	20	7.2	96,378	4,819	12,137	607	8.6	\$0.28	\$0.36	\$0.65
Compact Trucks	20	7.9	90,917	4,546	5,207	260	15.1	\$0.17	\$0.16	\$0.33
½ Ton Trucks	11	8.5	65,557	5,960	5,055	460	13.2	\$0.16	\$0.22	\$0.38

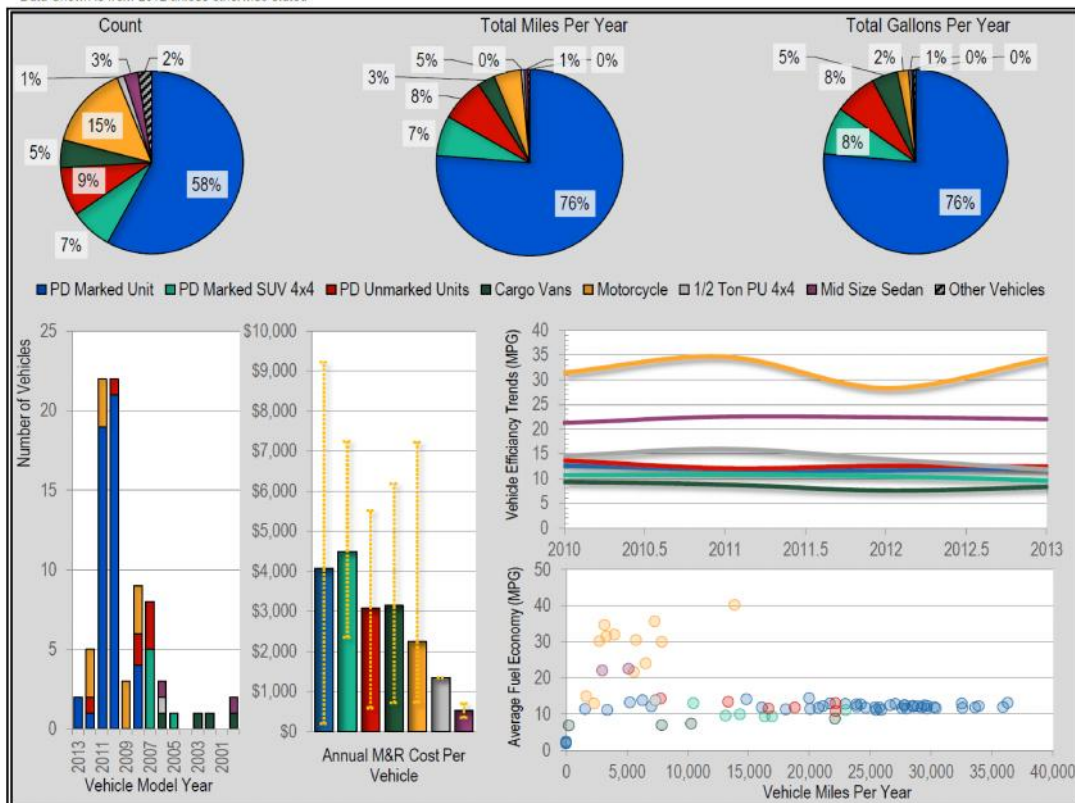


The Police Department Fleet includes vehicles from the city’s Patrol Administration and Traffic Services (motorcycle fleet). The summary includes the 7 vehicle groups with the highest total fuel consumption and the remaining vehicles combined in an “Other Vehicles” group. Together the specified vehicle groups account for 98% of the vehicles and virtually all of the on road vehicle fuel consumption within the Police Department. The “Other Vehicles” include a GMC 3500 van and a Chevrolet 3500 HD pickup (these are not included in the bottom four charts on the summary). Notable areas of interest include:

- Patrol cars are on average 11% more efficient than patrol SUVs (11.6 mpg vs. 10.5 mpg respectively)
- Motorcycles have the highest average fuel economy, at 28 mpg, but have very high maintenance and repair costs (the highest M&R costs per mile of the entire Police Department Fleet)
- Unmarked units and sedans have much higher fuel economy than patrol (marked) police vehicles, this is likely due to extensive idling on the part of the patrol vehicles
- Most vehicles are turned over quickly and patrol vehicles have an expected life of only 3 years

	Count	Age	Total Miles Per Year	Unit Miles Per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
PD Marked Unit	47	2.6	1,033,526	21,990	84,563	1,799	11.6	\$0.17	\$0.23	\$0.40
PD Marked SUV 4x4	6	6.3	94,213	15,702	9,188	1,531	10.5	\$0.29	\$0.28	\$0.56
PD Unmarked Units	7	4.6	103,101	14,729	8,296	1,185	12.6	\$0.21	\$0.23	\$0.44
Cargo Vans	4	12.3	40,526	10,132	5,039	1,260	7.6	\$0.31	\$0.35	\$0.66
Motorcycle	12	3.0	64,153	5,346	2,226	185	28.3	\$0.42	\$0.13	\$0.55
1/2 Ton PU 4x4	1	7.0	7,364	7,364	530	530	13.9	\$0.18	\$0.20	\$0.38
Mid Size Sedan	2	10.5	8,125	4,063	362	181	22.4	\$0.13	\$0.13	\$0.25
Other Vehicles	2	7.5	4,785	2,393	446	223	9.7	\$0.12	\$0.23	\$0.35
Total or Average	81	4.0	1,355,793	16,738	110,650	1,366	14.2	\$0.20	\$0.23	\$0.43

Data Shown is from 2012 unless otherwise stated

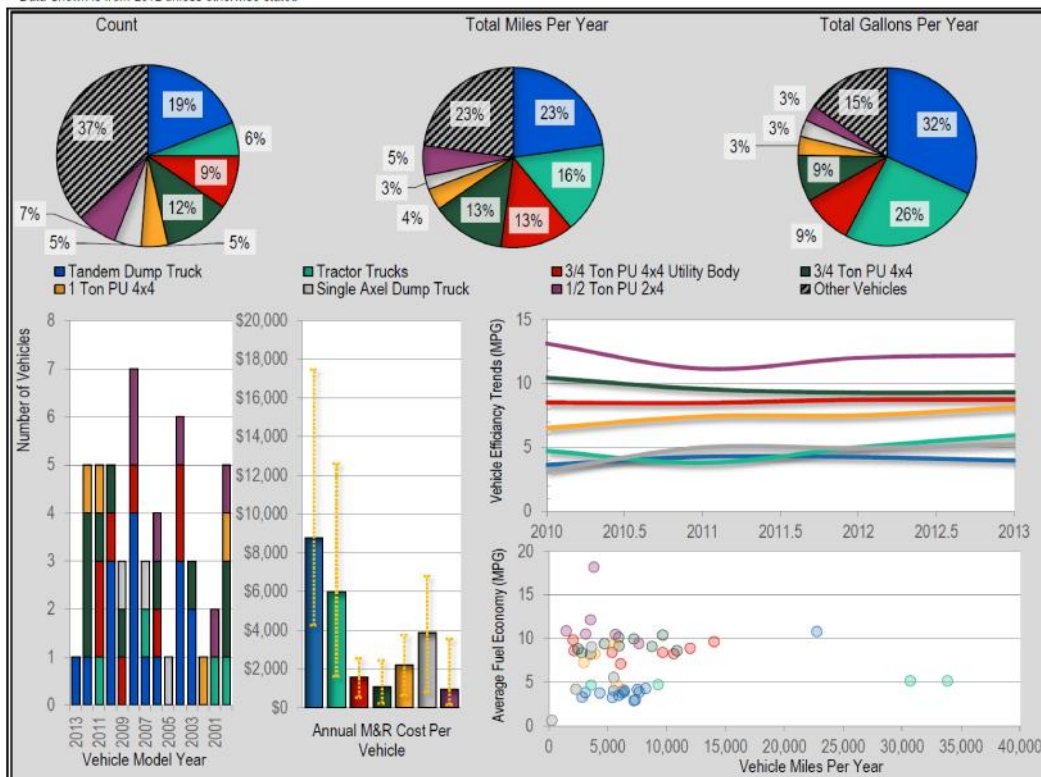


The Department of Public Works and Utilities Fleet is comprised of many subdivisions including Streets, Water Construction, Water Field Operations, Meter Shop, Water Resources, Waste Water Treatment, Semper, and Bio-Solids. The summary includes the 7 vehicle groups with the highest total fuel consumption and the remaining vehicles combined in an “Other Vehicles” group. Together the specified vehicle groups account for 63% of the vehicles and 85% of the total on road vehicle fuel consumption within the Department of Public Works and Utilities. The “Other Vehicles” include cargo vans, vans, utility bed trucks, small pickups, SUVs, a street sweeper, and hybrid vehicles (these are not included in the bottom four charts on the summary). Annual operational data for the heavy duty trucks was provided as hourly data which was converted to equivalent miles by dividing the vehicle odometer reading by total hours over vehicle life. Notable areas of interest include:

- Half ton pickup trucks return 61% better fuel economy than 1 ton and 29% better than ¾ ton pickups
- Due to extremely high M&R costs, tandem dump trucks are the most costly vehicle to operate per mile
- This division has the highest vehicle type variability throughout the entire city fleet
- Operates one hybrid vehicle (2008 Toyota Prius), which returns an average of 52 mpg

	Count	Age	Total Miles Per Year	Unit Miles Per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
Tandem Dump Truck	16	5.6	107,554	6,722	24,955	1,560	4.2	\$1.22	\$0.75	\$1.97
Tractor Trucks	5	10.0	77,575	15,515	20,383	4,077	5.0	\$0.38	\$0.85	\$1.23
3/4 Ton PU 4x4 Utility Body	8	5.1	62,360	7,795	7,172	896	8.7	\$0.18	\$0.32	\$0.50
3/4 Ton PU 4x4	10	5.8	62,344	6,234	6,659	666	9.3	\$0.17	\$0.30	\$0.48
1 Ton PU 4x4	4	7.0	18,368	4,592	2,676	669	7.5	\$0.48	\$0.42	\$0.90
Single Axle Dump Truck	4	7.8	11,892	2,973	2,402	600	4.9	\$1.30	\$0.65	\$1.95
1/2 Ton PU 2x4	6	9.5	25,508	4,251	2,290	382	12.0	\$0.22	\$0.25	\$0.47
Other Vehicles	31	8.4	108,314	4,194	12,036	483	12.2	\$0.51	\$0.46	\$0.98
Total or Average	84	7.4	473,914	5,642	78,572	935	9.1	\$0.55	\$0.51	\$1.06

Data Shown is from 2012 unless otherwise stated

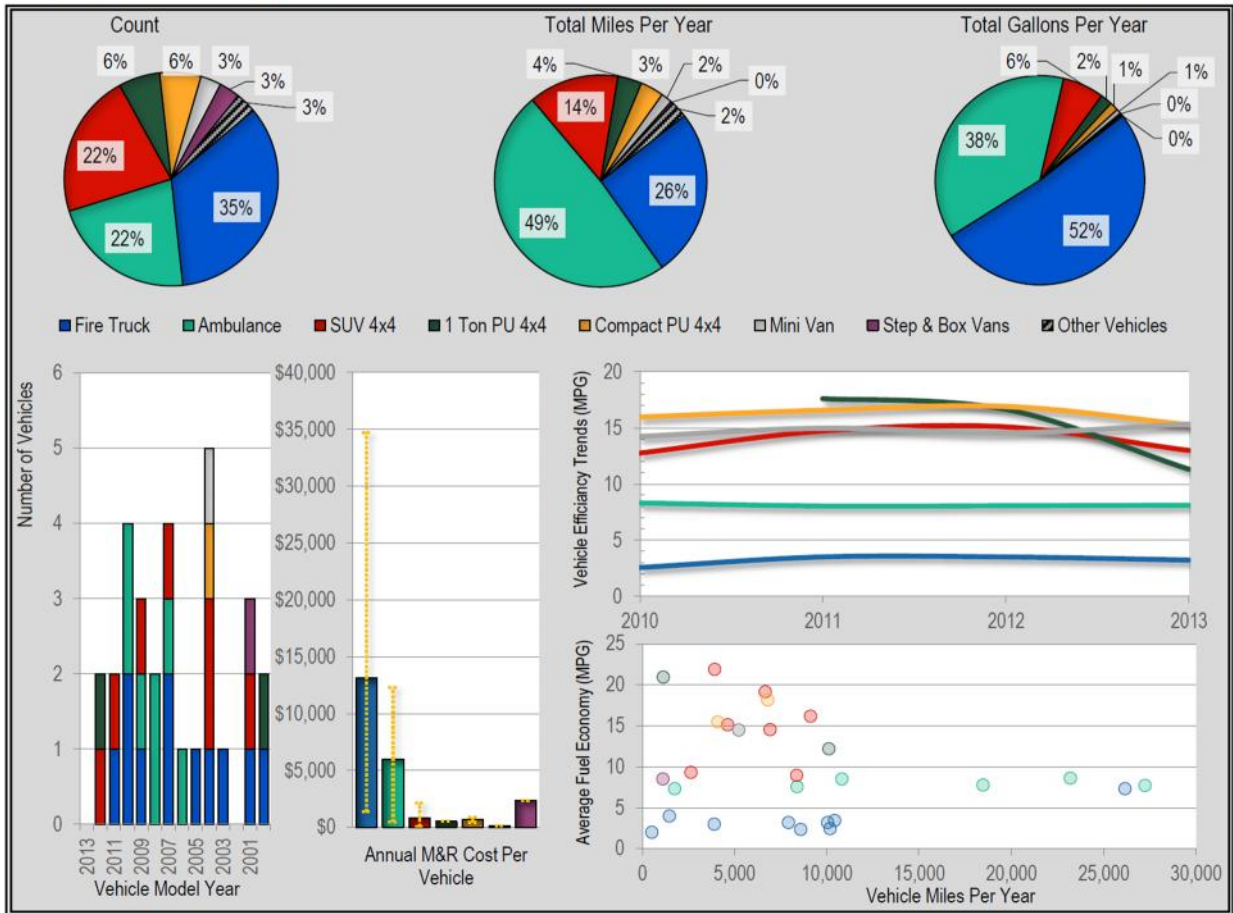


The Fire Department Fleet includes Field Operations, EMS Programs, and Prevention Divisions, employs a wide variety of vehicles, all of which were included in this summary (mpg data provided for the 2 ton truck at ~70 mpg does not appear accurate and was excluded from the chart). Utilization data for heavy duty trucks and fire trucks was provided on a per hour basis which was converted to equivalent miles by dividing the vehicle odometer reading by total hours over vehicle life. Notable areas of interest include:

- With the exception of ambulances, vehicles have a very low turnover rate
- One ton pickup trucks return 58% better fuel economy other one ton pickups in the city fleet
- The freightliner van is a very expensive vehicle to operate on a per mile basis overall, however, if this is a tactical response vehicle, the costs incurred may be unavoidable

	Count	Age	Total Miles Per Year	Unit Miles Per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
Fire Truck	11	7.1	79,383	7,217	24,921	2,266	3.5	\$1.82	\$1.01	\$2.83
Ambulance	7	4.7	150,101	21,443	18,148	2,593	8.1	\$0.28	\$0.39	\$0.67
SUV 4x4	7	6.1	42,426	6,061	3,085	441	15.1	\$0.13	\$0.21	\$0.34
1 Ton PU 4x4	2	9.5	11,304	5,652	881	441	16.7	\$0.05	\$0.22	\$0.27
Compact PU 4x4	2	11.0	10,952	5,476	639	320	16.9	\$0.12	\$0.16	\$0.29
Mini Van	1	9.0	5,251	5,251	361	361	14.6	\$0.03	\$0.19	\$0.22
Step & Box Vans	1	12.0	1,138	1,138	132	132	8.6	\$2.08	\$0.37	\$2.45
2 Ton Trucks	1	5.0	7,818	7,818	111	111	N/A	\$0.75	\$0.05	\$0.79
Total or Average	32	6.9	308,374	9,637	48,278	1,509	9.8	\$0.66	\$0.50	\$1.15

Data Shown is from 2012 unless otherwise stated

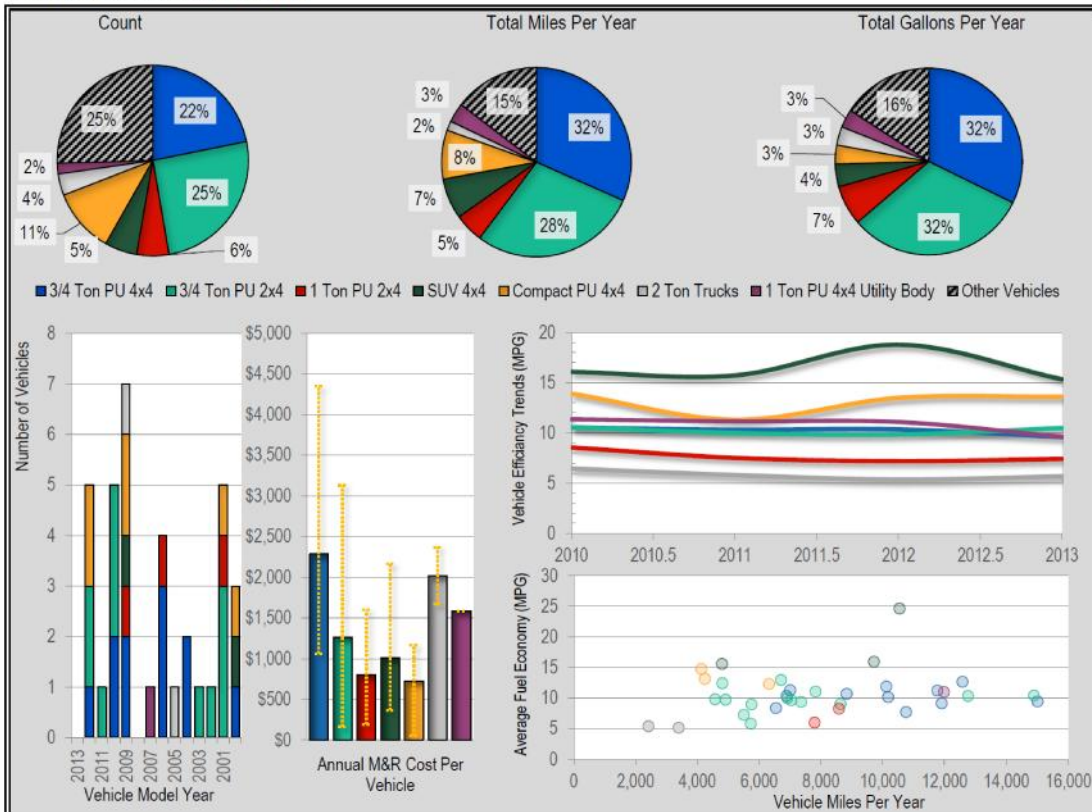


The Department of Parks, Recreation, and Libraries Fleet is comprised of 56 vehicles. The summary includes the 7 vehicle groups with the highest total fuel consumption and the remaining vehicles combined in an “Other Vehicles” group. Together the specified vehicle groups account for 75% of the vehicles and 84% of the total on road vehicle fuel consumption. The “Other Vehicles” group includes pickup trucks, vans, a trash truck, a sedan, and a 40-foot bus (these are not included in the bottom four charts on the summary). Annual utilization data for the heavy duty trucks was submitted on a per hour basis which was converted to equivalent miles by dividing the vehicle odometer reading by total hours over vehicle life. Notable areas of interest include:

- One ton, 4x4 utility bed trucks were significantly (54%) more efficient than one ton 2x4 trucks, higher idling periods are most likely the culprit
- ¾ ton 4x4 pickups were also more efficient (5%) than ¾ ton 2x4 pickups
- Operates a single bus, rarely used and not a significant source of fuel consumption, however, M&R costs are extremely high considering mileage (assuming data is accurate)

	Count	Age	Total Miles Per Year	Unit Miles Per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
3/4 Ton PU 4x4	12	6.8	114,712	9,559	11,012	918	10.3	\$0.24	\$0.27	\$0.51
3/4 Ton PU 2x4	14	7.8	103,647	7,403	10,749	768	9.8	\$0.17	\$0.29	\$0.46
1 Ton PU 2x4	3	7.7	18,117	6,039	2,352	784	7.2	\$0.13	\$0.37	\$0.50
SUV 4x4	3	11.3	25,104	8,368	1,344	448	18.8	\$0.12	\$0.15	\$0.27
Compact PU 4x4	6	6.0	30,307	5,051	1,113	186	13.5	\$0.12	\$0.10	\$0.22
2 Ton Trucks	2	6.0	5,844	2,922	1,099	549	5.3	\$0.69	\$0.53	\$1.22
1 Ton PU 4x4 Utility Body	1	6.0	11,998	11,998	1,083	1,083	11.1	\$0.13	\$0.29	\$0.42
Other Vehicles	14	11.0	52,892	4,532	5,383	382	11.3	\$0.46	\$0.28	\$0.74
Total or Average	55	8.1	362,622	6,593	34,134	621	10.7	\$0.24	\$0.27	\$0.51

Data Shown is from 2012 unless otherwise stated

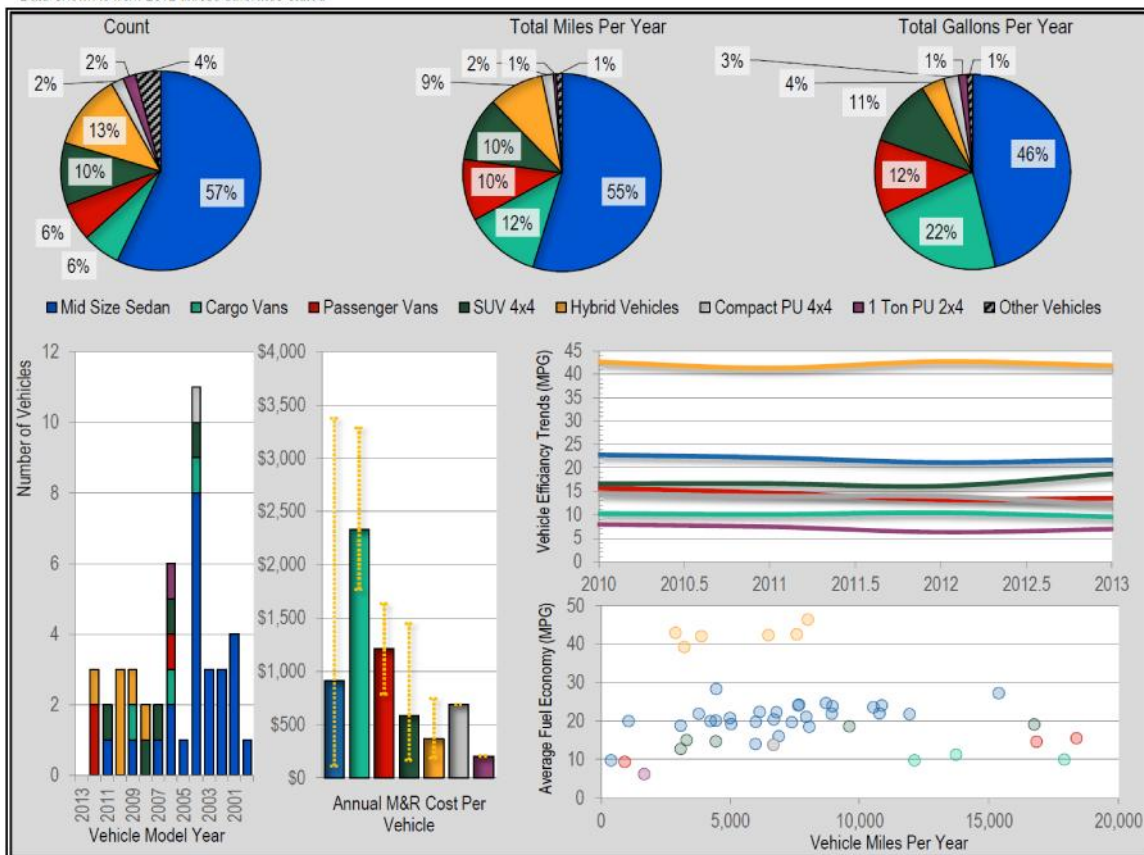


The Police Department Special Services Fleet is comprised of the following subdivisions: Neighborhood Services, Investigations, Professional Services, Records, Property, and Evidence, and Communications. The summary includes the 7 vehicle groups with the highest total fuel consumption and the remaining vehicles combined in an “Other Vehicles” group. Together the specified vehicle groups account for 96% of the vehicles and 99% of the total on road vehicle fuel consumption within the Police Department for Special Services. The “Other Vehicles” include a Chevrolet Astro van and Colorado pickup truck (these are not included in the bottom four charts on the summary). Notable areas of interest include:

- Utilizes mid-size sedans (mostly Chevrolet Malibu’s) for most operations and consume the most fuel
- Operates 6 hybrid vehicles (Toyota Prius) that return an average of 43 mpg
- Hybrid vehicles also have extremely low M&R costs resulting in the lowest cost per mile by a wide margin
- One ton truck has significantly lower fuel economy than typical for overall fleet

	Count	Age	Total Miles Per Year	Unit Miles Per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
Mid Size Sedan	28	9.6	195,052	6,966	9,038	323	21.1	\$0.13	\$0.13	\$0.26
Cargo Vans	3	6.7	43,818	14,606	4,239	1,413	10.4	\$0.16	\$0.27	\$0.43
Passenger Vans	3	3.0	36,189	12,063	2,427	809	13.2	\$0.07	\$0.19	\$0.26
SUV 4x4	5	5.8	37,262	7,452	2,155	431	16.1	\$0.08	\$0.16	\$0.24
Hybrid Vehicles	6	3.2	32,108	5,351	745	124	42.7	\$0.07	\$0.07	\$0.13
Compact PU 4x4	1	9.0	6,684	6,684	480	480	13.9	\$0.10	\$0.20	\$0.31
1 Ton PU 2x4	1	7.0	1,693	1,693	270	270	6.3	\$0.12	\$0.45	\$0.57
Other Vehicles	2	5.0	3,359	1,679	186	93	17.4	\$0.35	\$0.15	\$0.50
Total or Average	49	7.6	356,164	7,269	19,539	399	21.5	\$0.12	\$0.15	\$0.27

Data Shown is from 2012 unless otherwise stated

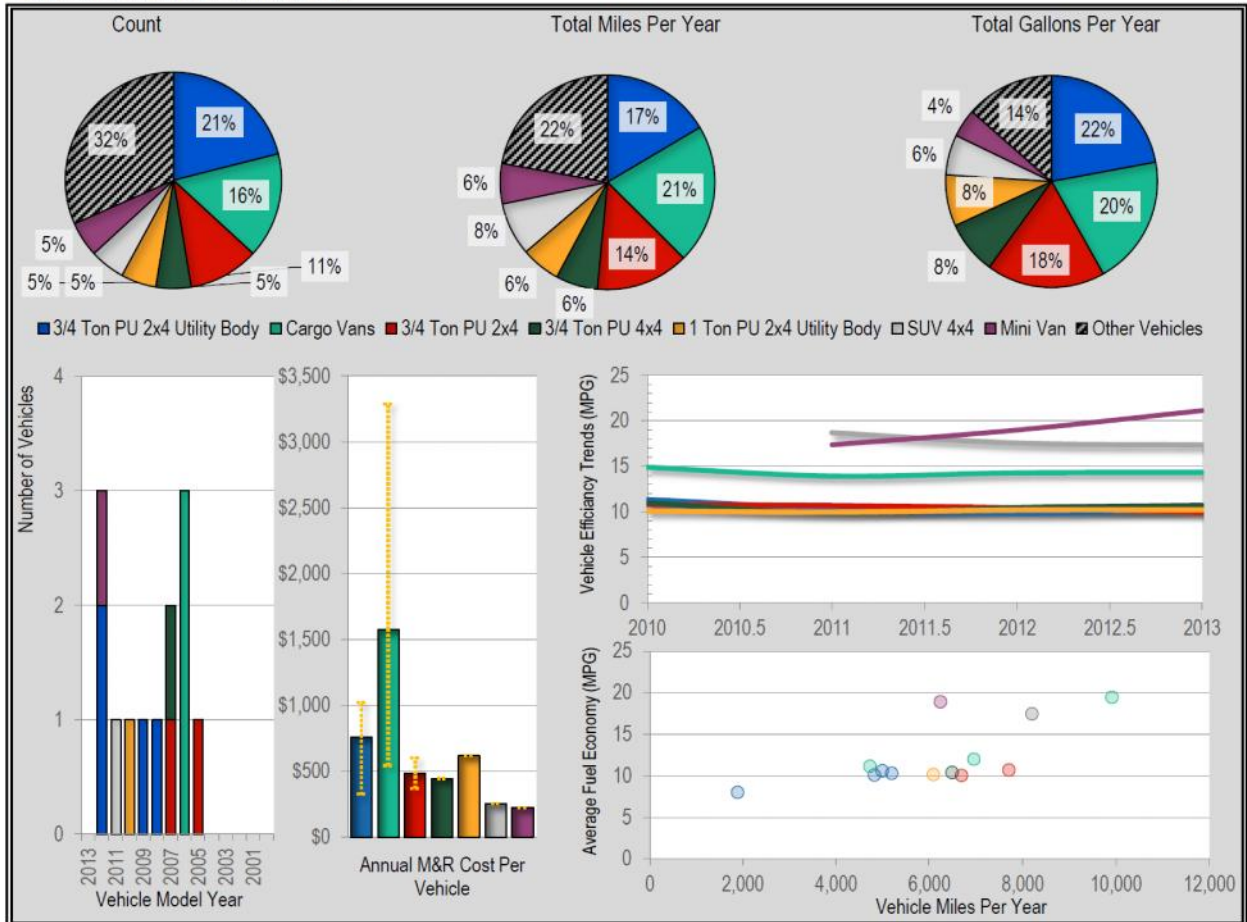


The Department of General Services Fleet summary includes the 7 vehicle groups with the highest total fuel consumption and the remaining vehicles combined in an “Other Vehicles” group. Together the specified vehicle groups account for 68% of the vehicles and 86% of the total on road vehicle fuel consumption within the Department of General Services. The “Other Vehicles” include additional pickup trucks, heavy duty trucks, hybrid cars, and a sedan (these are not included in the bottom four charts on the summary). Utilization data for heavy duty trucks and fire trucks was provided on a per hour basis which was converted to equivalent miles by dividing the vehicle odometer rating by total hours over vehicle life. Notable areas of interest include:

- Operates a very diverse fleet with a limited number of similar vehicles in any type
- Uses 2 hybrid vehicles (Toyota Prius) which return an average of 43 mpg and require very little maintenance

	Count	Age	Total Miles Per Year	Unit Miles Per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
3/4 Ton PU 2x4 Utility Body	4	2.8	16,929	4,232	1,679	420	9.8	\$0.18	\$0.28	\$0.46
Cargo Vans	3	7.0	21,617	7,206	1,507	502	14.3	\$0.22	\$0.20	\$0.42
3/4 Ton PU 2x4	2	7.0	14,417	7,209	1,379	689	10.4	\$0.07	\$0.27	\$0.34
3/4 Ton PU 4x4	1	6.0	6,493	6,493	620	620	10.5	\$0.07	\$0.27	\$0.34
1 Ton PU 2x4 Utility Body	1	3.0	6,094	6,094	597	597	10.2	\$0.10	\$0.28	\$0.38
SUV 4x4	1	2.0	8,211	8,211	468	468	17.5	\$0.03	\$0.16	\$0.19
Mini Van	1	1.0	6,245	6,245	329	329	19.0	\$0.04	\$0.15	\$0.19
Other Vehicles	6	12.0	22,809	3,247	1,028	176	23.1	\$0.20	\$0.06	\$0.26
Total or Average	19	6.3	102,815	5,411	7,607	400	16.8	\$0.14	\$0.21	\$0.35

Data Shown is from 2012 unless otherwise stated

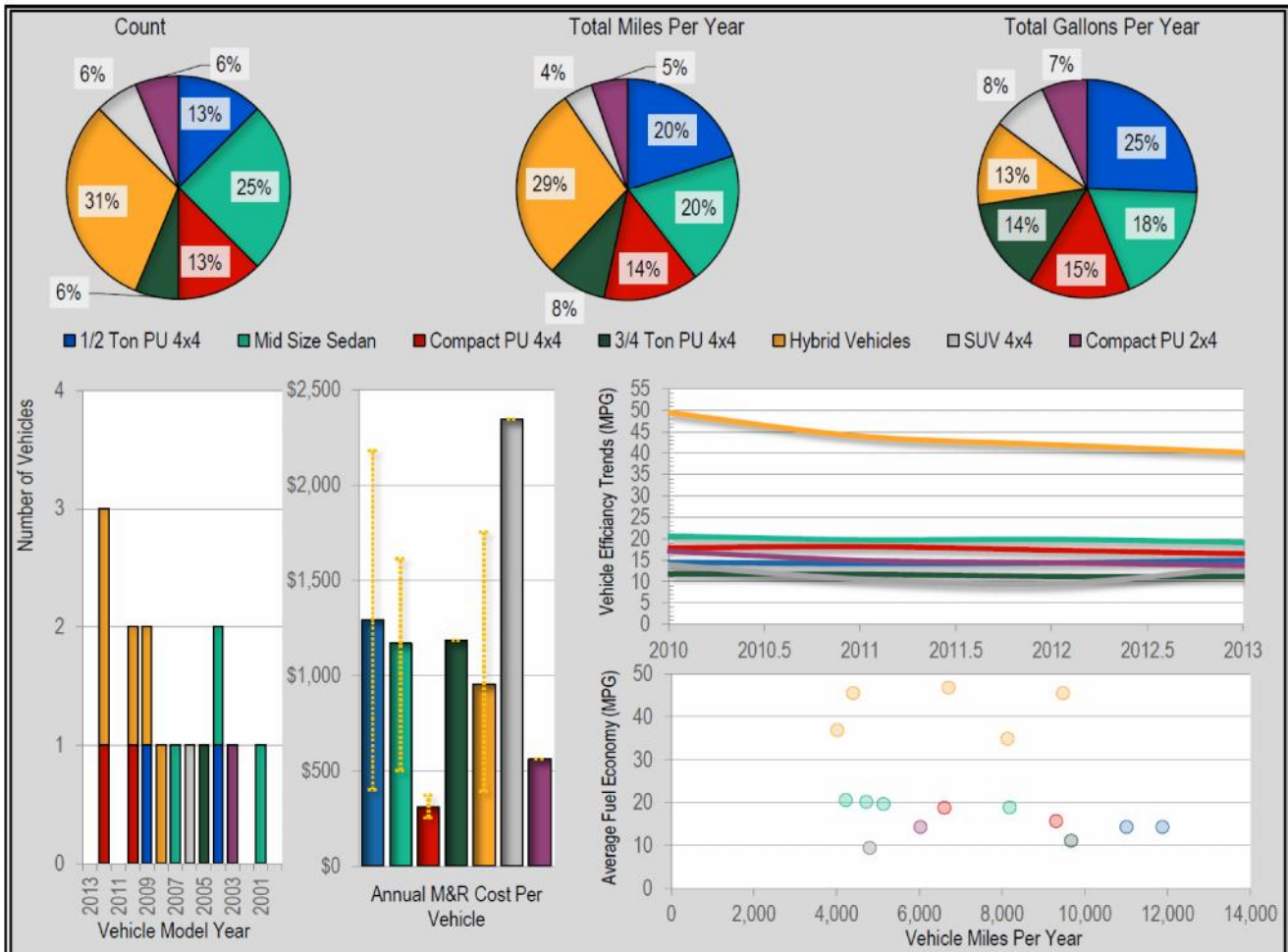


The Department of Community Development Fleet has 16 on road vehicles within 7 vehicle types. Utilization data for heavy duty utility trucks was provided on an hourly basis which was converted to equivalent mileage by dividing the vehicle odometer rating by total hours over vehicle life. Notable areas of interest include:

- Operates 5 hybrid cars which return an average fuel economy of 42 mpg
- Non-hybrid cars return less than half the fuel economy of the hybrids and cost significantly more per mile because of M&R costs (this could be partially due to their older age)
- Half ton pickup trucks return 28% better fuel efficiency than ¾ ton trucks

	Count	Age	Total Miles Per Year	Unit Miles Per Year	Total Gallons Per Year	Unit Gallons Per Year	MPG	M&R Cost (\$/mile)	Fuel Cost (\$/mile)	Total Cost (\$/mile)
1/2 Ton PU 4x4	2	6.5	22,914	11,457	1,594	797	14.4	\$0.11	\$0.20	\$0.31
Mid Size Sedan	4	10.0	22,311	5,578	1,131	283	19.9	\$0.21	\$0.14	\$0.35
Compact PU 4x4	2	2.0	15,941	7,971	940	470	17.4	\$0.04	\$0.17	\$0.21
3/4 Ton PU 4x4	1	8.0	9,681	9,681	862	862	11.2	\$0.12	\$0.25	\$0.37
Hybrid Vehicles	5	2.8	32,785	6,557	790	158	42.0	\$0.15	\$0.07	\$0.21
SUV 4x4	1	7.0	4,811	4,811	503	503	9.6	\$0.49	\$0.29	\$0.78
Compact PU 2x4	1	10.0	6,044	6,044	419	419	14.4	\$0.09	\$0.20	\$0.29
Total or Average	16	6.0	114,487	7,155	6,238	390	24.3	\$0.15	\$0.15	\$0.30

Data Shown is from 2012 unless otherwise stated



ALTERNATIVE FUELS AND TRANSPORTATION TECHNOLOGIES

Biodiesel is produced from vegetable oils, animal fats, and recycled restaurant grease, all of which can be obtained and produced domestically. Biodiesel can be mixed with petroleum diesel to produce blends such as B5 (5% biodiesel and 95% petroleum diesel). It can also be used without blending with petroleum diesel (B100), but biodiesel has an inherent cleaning agent that can dislodge built-up sediment and clog fuel filters at higher blends. B20 is the most common blend used because it is the highest level of biodiesel that manufacturers allow under their warranties (although some might limit it to only B5). Biodiesel can be stored in tanks previously used for petroleum diesel if they are thoroughly cleaned.

Advantages

- B20 produces 15% less carbon dioxide emissions than petroleum diesel²
- Biodiesel is safer to handle compared to petroleum diesel
- Biodiesel can be domestically produced from renewable resources

Disadvantages

- Lower fuel economy and power than petroleum diesel (10% lower for B100, 2% for B20)²
- Biodiesel will gel or solidify at low temperatures (varies depending on the source from which it is produced)
- Biodiesel is more expensive than petroleum diesel

Ethanol is a renewable fuel produced from biomass or various plant materials. Currently, the main source of ethanol is corn grain or other starch-based crops. Ethanol is blended with gasoline at low levels such as E10 (10% ethanol and 90% gasoline) which can be used in most gasoline vehicles newer than 1995 with no modifications. Flexible fuel vehicles (FFVs) can use ethanol blends up to E85 and are readily available in most vehicle categories. Standard gasoline fueling equipment can be used to dispense ethanol blends or blender pumps can be used to provide a variety of blends. Ethanol readily absorbs water, so some additional measures may be used to prevent any potential exposure to moisture.

Advantages

- Easy to implement due to similarities with gasoline and there are many vehicle options
- Ethanol can be produced from domestically grown crops and waste
- Ethanol has a higher octane number than gasoline, offering increased vehicle power and performance

Disadvantages

- Ethanol blends have a lower energy content than gasoline, resulting in fewer miles per gallon
- Based on energy content, there is minimal or no economic benefit with ethanol
- Only FFVs can use ethanol blends higher than E15

Natural gas, composed primarily of methane, is obtained from underground wells and can be extracted along with crude oil. Bio methane is a renewable gas produced from waste. Enhanced extraction methods such as hydraulic fracturing, have drastically increased the availability of natural gas and lowered its price. Natural gas must be in the form of compressed natural gas (CNG) or liquefied natural gas (LNG) when used as an alternative fuel to increase its energy density for storage on the vehicle. In order to store and delivery natural gas in these forms, both CNG and LNG fueling infrastructure are more complex and costly. There are various natural gas engines and configurations that include: dedicated (runs only on natural gas), bi-fuel (runs on either natural gas or gasoline), dual fuel (blends natural gas into a diesel engine), and another that run primarily on natural gas but uses diesel to ignite it in a compression ignition engine.

² Fueleconomy.gov. Biodiesel. U.S. Department of Energy, Energy Efficiency and Renewable Energy & U.S. Environmental Protection Agency, Office of Transportation and Air Quality. Last modified Friday September 27 2013. www.fueleconomy.gov/feg/biodiesel.shtml.

Advantages

- Natural gas is much less expensive than gasoline
- 94% of natural gas used in the U.S. is domestically produced³
- There are many commercially available retrofit and new vehicle options for natural gas

Disadvantages

- Storage of CNG on the vehicle will take up additional space and increase the initial cost of the vehicle
- Public fueling infrastructure is limited and it is costly to build
- Facility modifications and specially trained technicians are needed to service natural gas vehicles

Propane is a high energy and clean burning alternative fuel that is commonly used for domestic heating and cooking. Also known as liquefied petroleum gas (LPG), propane is produced as a by-product of crude oil refining and natural gas processing. It is generally less expensive per gallon, but propane has lower energy content than gasoline, resulting in a lower fuel economy for propane vehicles. Propane fueling is commonly done locally for gas grill cylinders and many U-Haul locations offer propane for vehicles. Vehicles must be converted to operate on propane and there is a cost premium. Both dedicated and bi-fuel LPG configurations are available.

Advantages

- Fuel costs are lower than conventional petroleum fuels
- The amount of time to fuel and the driving range is similar to conventional gasoline vehicles
- Propane is nontoxic and can produce lower amounts of greenhouse gases and air pollutants depending on the vehicle and engine specifications.

Disadvantages

- Lower fuel economy than conventional gasoline vehicles
- Higher cost premium for propane vehicles
- Limited vehicle fueling infrastructure

Electricity is produced and distributed domestically using a variety of sources. Natural gas and nuclear electric power plants have fewer emissions than coal plants, while renewable energy, such as hydroelectric, solar photovoltaic, and wind turbines have the lowest environmental impact. Plug-in electric vehicles (PEVs) include battery electric vehicles (BEV) which only use electric power, and plug-in hybrid electric vehicles (PHEVs) which use an internal combustion engine when electrical power is depleted. PEVs can be charged from a conventional outlet, or special charging stations can be used for a faster charge.

Advantages

- BEVs produce no tailpipe emissions
- Electricity is a readily accessible and domestic energy resource
- PEVs have a much lower cost per mile to operation and less maintenance is required

Disadvantages

- The energy density of batteries limits the electric range of PEVs
- Conventional charging methods require extended periods to recharge the battery pack
- Battery packs take up a large amount of space and could be expensive to replace

Hydrogen is a very abundant element (one of the two elements that make up water - H₂O), but it cannot be found naturally by itself. Hydrogen can be produced from a wide range of sources, the most common being from hydrocarbon fuels such as natural gas. Electrolysis can be used to create hydrogen from water, but it is an

³ Fueleconomy.gov. Natural Gas. U.S. Department of Energy, Energy Efficiency and Renewable Energy & U.S. Environmental Protection Agency, Office of Transportation and Air Quality. Last modified Friday September 27 2013. www.fueleconomy.gov/feg/bifueltech.shtml.

energy intensive process. As a fuel, hydrogen can be burned in an internal combustion engine, or used to create electricity in a fuel cell which produces only water with no harmful emissions. Unfortunately, it requires energy to produce hydrogen and it has a much lower energy density than gasoline so it must be stored at high volumes to be used as a fuel. Only pre-production hydrogen fuel cell vehicles are available and they are too expensive for commercial distribution. Limited fueling locations also restricts where they can be implemented.

Advantages

- Hydrogen can be produced from several sources domestically
- Hydrogen fuel cell vehicles produce no air pollutants or greenhouse gasses
- Hydrogen fueling can be completed quickly

Disadvantages

- The storing and distribution of hydrogen requires extremely low temperatures, specialized tanks, and trained professionals
- Energy is required to produce hydrogen which can result in lower overall efficiency and higher costs
- Hydrogen infrastructure and vehicles are currently expensive and very limited in availability

Dimethyl ether (DME) is a clean gas that can be produced from many renewable materials, as well as from fossil fuels. Similar to propane, DME is a gas in ambient conditions, but will convert to a liquid when subjected to cooler temperature and modest pressure. The low storage pressure of DME does not require highly pressurized tanks which makes it easier for transport and dispensing. In some studies, DME has been proven to possess a 30% higher fuel economy than gasoline vehicles⁴. DME is not currently commercially available and research on vehicle use is still in progress.

Advantages

- DME can be easily transported, stored, and dispensed as a liquid at low pressure
- Possesses no toxic components
- Can be produced from renewable compost such as waste from paper mills, agricultural by-products, municipal waste, as well as from natural gas and coal⁴

Disadvantages

- There have been limited vehicle tests performed with DME as a fuel source
- DME chemically attacks commonly used seals, which could damage injection equipment in vehicles⁵
- DME has a lower energy per volume than diesel fuel

Hybrid electric vehicles (HEVs) utilize both an internal combustion engine and an electric motor during driving. The electric motor can directly power the drivetrain in most HEVs, although some use the electric motor only for additional power when needed. In most HEV configurations, the engine provides power directly to the drivetrain, but it can also be used as a generator to provide electrical power for the motor or batteries. The electric motor can draw power from a battery pack when it has sufficient charge. Regenerative braking technology is incorporated to convert the momentum of the vehicle into electrical energy that is used to charge the onboard battery. The battery pack and electric motor allow HEVs to shut down the engine when stationary and most can use the electric motor to power the vehicle entirely under low speed conditions.

Advantages

- A smaller, more efficient internal combustion engine may be used because the electric motor could provide additional power during acceleration and hill climbing
- Operating on solely the electric motor is significantly quieter than an internal combustion engine

⁴ International DME Association. About DME. www.aboutdme.org/index.asp?sid=48.

⁵ Arcoumanis, C. A technical Study on Fuels Technology related to the Auto-Oil II Programme, Volume II: Alternative Fuels. December 2000. http://ec.europa.eu/energy/oil/fuels/doc/alternative_fuels_en.pdf.

- Recovers energy during braking and eliminate idling which saves fuel and reduces tailpipe emissions

Disadvantages

- HEVs are more expensive than traditional gasoline vehicles
- Onboard batteries add extra weight to the vehicle and take up space
- Battery systems may be costly to replace

Hydraulic hybrid vehicles (HHVs) use accumulators and a hydraulic drive pump to help propel the vehicle. Accumulators store pressurized fluid, while the hydraulic drive, acting as a motor, uses the pressurized fluid to rotate the wheels. The hydraulic drive can also act as a pump to re-pressurize hydraulic fluid using the momentum of the vehicle. There are two forms of HHVs: series and parallel. A series HHV relies on hydraulic pressure to drive the wheels, while the engine remains in an off state and is only used to apply additional fluid pressure to the hydraulic drive when needed. In a parallel HHV, both the engine and the hydraulic drive system interact with the wheels.

Advantages

- Technology already exists; no significant breakthroughs are required
- Hybrid controller regulates engine performance to promote optimal efficiency & fuel economy
- Depending on the vehicle setup, HHVs can improve fuel economy by 40% (parallel system) up to 60%-70% (series)⁶

Disadvantages

- Series HHVs need additional technology to power electrical systems
- The pressure tanks of accumulators are currently expensive to manufacture and purchase
- The hydraulic drive system takes up a considerable amount of space on a vehicle

Automatic stop-start systems (sometimes referred to as idle-stop systems) can shut down an internal combustion engine and then restart the engine once the gas pedal is pressed. Typically this is only done while stationary, but it can also be employed while coasting or braking. The electric starter controls the status of the engine while a larger battery system is needed to supply the higher and more regular power demand. Once the gas pedal is pressed, the starter draws power from the battery to restart the engine so that it can provide power to the drivetrain. Start-stop technology is common in HEVs; however car manufacturers have begun to incorporate the technology into commercial gasoline vehicles. Limited retrofit solutions are also available.

Advantages

- Eliminates idling
- Increases overall fuel economy
- Aftermarket systems available at low cost

Disadvantages

- Systems have a slightly slower response from stops than conventional vehicles
- Moderate vehicle modifications are required for certain systems (Belt-Driven Starter-Generator, Integrated/Crankshaft Starter Generator)⁷
- May cause additional engine wear

Auxiliary power units (APU) are portable, vehicle-mounted systems that provide power for climate control and electrical devices in trucks, locomotives, and vehicles without idling. These systems compose of a small internal combustion engine equipped with a generator and heat-recovery system to provide electricity and heat. Some

⁶ Dealton, J. How Hydraulic Hybrids Work. How Stuff Works. <http://auto.howstuffworks.com/hydraulic-hybrid.htm>

⁷ Kremer, M. In-market Application of Start-Stop Systems in European Market. FEV Inc. December 2011. www.theicct.org/sites/default/files/FEV_LDV%20EU%20Technology%20Cost%20Analysis_StartStop%20Overview.pdf.

systems are battery operated and can be installed on a vehicle with little modification or complexity. Engine-based APUs are better suited for emergency, construction, and other heavy duty vehicles; while battery operated APUs are incorporated in medium and light duty vehicles.

Advantages

- Supplies power to onboard equipment without having to idle, reducing emissions
- Requires little vehicle modifications

Disadvantages

- Engine-based APUs are noisy and require more maintenance
- Requires space on the vehicle and has some initial cost

Fuel operated heaters draw fuel from the vehicle's onboard tank and combust it to create heat. These systems help reduce engine idling in cold weather, resulting in better fuel economy while reducing emissions. Coolant heaters warm the vehicle's coolant and circulate it to the vehicle's normal heating system, thus heating the engine and having the option to heat the interior of the vehicle. These are used primarily on heavy duty and medium duty vehicles. Air heaters blow hot air directly to the vehicle interior, which may be better suited for medium and light duty vehicles.

Advantages

- Coolant heaters burn eight times less fuel than an idling engine⁸, and air heaters burn even less
- Produces heat more rapidly than an idling engine with 1/20th the emissions⁸
- Many commercially available products with relatively simple installations

Disadvantages

- Useful only in cold climates
- Air heaters have a smaller heat capacity than coolant heaters and cannot pre-heat the engine

Energy recovery systems use the vehicle's heat-transfer system, much like a coolant heater, but without a separate piece of equipment. A very small electric pump is connected to the water line, which keeps the truck's cooling system and heater operating after the engine is turned off, using engine heat that would otherwise dissipate. The engine heat is used to keep the cab of the vehicle warm. This reduces the time that the engine idles to provide the same heat energy.

Advantages

- Uses excess heat from the engine to keep the cab warm
- Technology can be incorporated into light, medium, and heavy duty vehicles
- Simple installation

Disadvantages

- Effective only for a short length of time
- Commercial availability is limited

The technology matrix on the following page summarizes the commercial availability of alternative fuel vehicles by fuel and vehicle type.

⁸ Lichtner, R. Webasto Fuel Operated Heater Cleanly Warms Car; Vehicle Preheating Device Warms Car, Saves Fuel and Reduces Pollution – More Benefits than Conventional Remote Start. Environmental News Network. November 16, 2005. www.enn.com/press_releases/1453.

Alternative Fuel and Technology Applicability Matrix

	HEV	PHEV	BEV	HHV	D-NG	B-NG	D-LPG	B-LPG	B20	FFV	APU	FOH	SS
Passenger Car	●	○			●		○		P	●			○
Minivan					○	○		○					
Sport Utility Vehicle			○			●	○			●			
Police Motorcycle			○										
Police Car	●	○			○	○	○	○			○		
Police Sport Utility Vehicle	○				○					○			○
Police Pickup Truck	○									○			○
Police Van										○		○	○
1/2 Ton Pickup	○			○	○	○	○	○	○	●	○	○	○
3/4 Ton Pickup				○			○			●	○	○	○
1 Ton Pickup			○			○	○	○		●	○	○	○
Cargo Van				○	○	○	○	○	○	●		○	○
Medium-duty Dump Truck	○											○	○
Medium-duty Utility Truck	○	○	○								○	○	○
Ambulance					○						○		○
Fire Rescue Truck	○										○		○
Fire Pumper Truck					○						○		○
Fire Ladder Truck											○		○
Street Sweeper	○		○				○				○		
Refuse Truck	○			○	●						●	○	○
Heavy-duty Dump Truck	○						P		○		●	○	○
Heavy-duty Utility Truck		P			○		○	○	○		○	○	○
Front Loader/Skidsteer	○											○	
Excavator	○			○					○			○	
Backhoe									○			○	
Dozer	○								○		○	○	
Off-road Tractor	P						○		○	○			
Mower	○		○		○								
Utility Task Vehicle			●										
Forklift			●		●		●						

Key to Level of Development

- P** Pre-Production/Prototype
- Commercial Product: 1-5 Models Available
- ◎** Commercial Product: 6-10 Models Available
- Commercial Product: 11+ Models Available

Acronyms

- HEV** Hybrid Electric Vehicle
- PHEV** Plug-In Hybrid Electric Vehicle
- BEV** Battery Electric Vehicle
- HHV** Hybrid Hydraulic Vehicle
- D-NG** Dedicated Natural Gas Vehicle
- B-NG** Bi-fuel or Dual Fuel Natural Gas Vehicle
- D-LPG** Dedicated Propane Autogas Vehicle
- B-LPG** Bi-fuel or Dual Fuel Propane Autogas Vehicle
- B20** Diesel Vehicle Approved to use B20 or greater
- FFV** Flex-Fueled Vehicle Capable of Using E85
- APU** Auxiliary Power Unit
- FOH** Fuel Operated Heater (Coolant & Air Heaters)
- SS** Auto Stop-Start System

POTENTIAL FLEET SOLUTIONS

Alternative fuels and transportation technologies can potentially provide fuel, cost, and emission savings for the City of Westminster. The success of these strategies is based on a number of factors, including vehicle type and quantity, utilization levels, annual fuel consumption, fuel costs, and geographical location. Technologies with highest potential for economic benefit to the City of Westminster were identified as hybrid electric, plug-in hybrid electric, and idle reduction technologies. The business cases for these potential solutions are discussed in greater detail in the later subsections. The first subsection includes an overview of some fleet management practices that the City of Westminster should consider. These practices can be implemented in addition to any alternative fuel or advanced technology solution. Also included as a subsection are other alternative fuel and advanced technology solutions that are not currently good options for the City based on the operational characteristics and current market costs. However, it is possible that these other solutions may prove viable in the future if conventional fuel prices should increase or further fleet consolidation increases the per vehicle utilization.

Fleet Management Practices

Global Positioning System (GPS) Technology can be used for automated vehicle location reporting. GPS technology is especially useful in both determining route based efficiency and in determining utilization of the fleet by providing data on when equipment is used versus odometer or hour based usage. This data is more objective in determining how vehicles might be shared across the City of Westminster's departments, providing a log of exactly when and how the vehicles are used. A GPS technology solution with analysis and reporting is more cost effective when applied to a larger number of vehicles. A preliminary analysis on the value of GPS technology for the City's fleet was conducted to identify vehicle groups with high fuel use and high idle time that would most benefit from closely monitoring utilization. Based on that analysis which found over 200+ vehicle candidates with a positive return on investment, it is highly recommended that the City deploy GPS technology in its police fleet, fire trucks, tractor and tandem dump trucks, emergency medical services, pickups, and vans. Implementation of this technology across all city vehicles should also be considered, due to savings which cannot be accurately quantified until the technology is installed.

GPS technology will not provide savings as a standalone technology. It should be regarded as a precursor to the deployment of alternative fuel or advanced technology solutions and initiatives, as it can be used to verify baseline vehicle performance and provide comparative data to quantify the benefits of any implemented vehicle technology. One of the largest possibilities for fuel and maintenance cost savings from GPS technology lies in idle reduction potential. Most of the City's GPS vehicle candidates show a positive ROI solely based on the potential for idle reduction savings. This was estimated via comparison of actual fuel economy and EPA city cycle fuel economy ratings, but can only be verified with better monitoring using GPS. Other savings cannot be realized before looking at the GPS data post-installation, including route optimization, driver evaluations, geo-fencing, fuel card integration, payroll tracking, and a variety of others (both cost and safety related). These non-quantifiable savings have been proven through several relevant case studies with other cities.

Vehicle Right Typing should always be considered as units are replaced. Right-typing of equipment can provide both operational savings and reductions to overall emissions. Two areas should specifically be addressed. The

first opportunity is to reduce the size of vehicles where applicable to less expensive, more fuel efficient vehicles as units are replaced. This should be part of a purchasing strategy for new vehicles as operational needs are assessed with each purchase. The second opportunity is to use advances in duty specific equipment to reduce miles driven. One example of this could be using a sign trailer towed by a work truck rather than having a separate vehicle to direct traffic around a work area. Another example could be the use of “snow treatment systems” that cover more lanes at one time thus reducing the vehicle lanes needing to be driven. These and other strategies would allow the city to reduce the number of vehicles needed while also reducing the amount of miles driven and fuel used.

Fleet Right Sizing is optimizing the existing fleet and potentially eliminating or simply not replacing, particular vehicles which are not required for daily operations. Combining the operational duties of several vehicles into one can offer significant reduction in overall operational costs and increase the justification for advanced technologies or alternative fuels. While not having a major impact on emissions footprint since overall usage is not reduced, right-sizing the fleet can reduce both capital expenditures and maintenance costs as the number of vehicles in the fleet are reduced. With higher utilization per vehicle, the initial cost of technologies will be recovered more quickly through fuel savings. Sharing of vehicles, both within departments and across departments, is a primary method used to reduce the fleet numbers to increase utilization and reduce short and long term operating costs. Combining this initiative with adoption of GPS technology can help fine tune the size of the fleet over time though initial strides can be gained simply by reviewing usage data (odometer and hours meters) and working with the operations staffs in each of the divisions. Based on the vehicle inventory list provided, there is likely an opportunity to either reduce fleet size by either modifying vehicle assignments or pooling “very low” use vehicles. Light duty vehicles travelling less than 5,000 annual miles are candidates that are most likely eligible for pooling or re-assignments based on a preliminary right-sizing assessment. Further investigation of these vehicles is recommended to verify if right-sizing is feasible.

Solutions that are not Currently Economically Viable

Compressed Natural Gas (CNG) typically has the best success in fleets when a single type of vehicle accounts for a large percentage of the fleets overall fuel usage. This group of vehicles acts as an “anchor fleet” to justify the sizable investment required for fueling infrastructure. These vehicles are typically a large fleet of heavy duty on road vehicles which see heavy utilization and very dynamic duty cycles, such as transit buses and refuse trucks. The City of Westminster does not operate a large fleet of heavy duty vehicles that could prove viable candidates for CNG technology. There are three tractor trailers operated out of the Big Creek Wastewater Treatment plant that see high utilization and could be a potential application for dual fuel CNG technology (a retrofit solution that can be used to blend natural gas with diesel on the existing engine, providing up to 70% fuel displacement at steady state). However, the cost differential between diesel and CNG in Westminster is not currently significant enough to provide a return on investment within the life of the vehicles. Because of the limited number of vehicles, the installation of a dedicated CNG fueling station would not be economically viable and a public station would have to be used (there is currently no public CNG station near this location). Overall, the use of CNG for the tractor trucks would require a price difference between diesel and CNG of \$1.50 per diesel gallon equivalent (DGE) to provide a return on investment within the life of the tractors (10 years) and a price difference of \$2.35 per DGE to provide a return on investment within 5 years (current cost difference between diesel and CNG is \$0.72 per DGE).

Biofuels, including biodiesel and ethanol blended fuels, are the simplest technology to implement because they can use the same or similar fueling infrastructure. Most of the City's heavy-duty vehicles should have minimal issues using a biodiesel blend, especially any blend up to B20. Many of the fleet vehicles are new enough that there should not be significant deposit buildup in the fuel system that would be dislodged when using biodiesel blends (although additional preventative maintenance of checking the fuel filters and planning to change them soon after switching to a biodiesel blend is a recommended practice). Cold weather operation could also pose issues if higher concentrations of biodiesel and these fuels have more tendency to gel and must be maintained at warmer temperatures to avoid clogging filters. Many of the vehicle models in the City's light-duty fleet are offered in a flex-fueled configuration that might make them capable of using E85. A further assessment would be needed to determine exactly how many flex-fueled vehicles are currently in the fleet, which would be used to calculate the expected use of E85 if it was available. All light duty vehicles could use an E10 blend, but they could not all use E85, so a separate tank and dispenser would likely be needed. Biofuels can slightly reduce a fleet's overall greenhouse gas emissions based on a wells-to-wheels analysis. However, there is currently no economic benefit to the use of biofuel as it is typically more expensive per gallon than petroleum-based fuels based on available energy content.

Liquid Propane Gas (LPG) could be used for light duty vehicles, ordered as a special modification when purchasing a compatible vehicle. LPG is typically 20% cheaper per gasoline gallon equivalent (GGE) than gasoline. While LPG doesn't typically offer as much cost savings per gallon as CNG, the footprint and cost of fueling infrastructure is much less expensive. LPG vehicle safety practices are similar to conventional fuels so there are no required maintenance facility modifications. There are LPG options for pickup trucks, cargo vans, and cars. Fuel cost reduction is relatively low per gallon, so relatively high fuel usage is required to offset the vehicle retrofit costs, fueling station installation, and the lower energy content of LPG (consumes more fuel to do the same amount of work as gasoline or diesel). The City of Westminster also has access to relatively cheap fuel currently, which may make LPG less viable as an alternative fuel (depending on the lowest price that LPG could be obtained). As most of the City's light duty vehicles have low annual mileage, LPG should only be considered if a very favorable long term LPG price can be secured by the City. Potential savings from LPG would require a final cost of approximately \$1.00 per gallon (a price difference between gasoline and LPG of \$1.82 per gallon) to provide a feasible return on investment for some vehicles at current diesel prices.

Hybrid Electric Technology

Hybrid Electric Vehicles (HEVs) can be used for a wide variety of vehicle operations throughout the fleet and provide varying levels of savings depending on vehicle usage. The application of hybrid electric technology in the City of Westminster's fleet must be evaluated on a per vehicle basis as a relatively high level of utilization is necessary to justify the higher incremental costs. It was determined that replacing some vehicles with HEVs has the potential for significant fuel offsets, resulting in economic and emission savings over the life of the vehicle.

Applicable Hybrid Electric Vehicle Models

There are many hybrid electric car options currently available for the City of Westminster's fleet. The current fleet uses many midsize sedans which could be replaced with similarly sized hybrid cars. However, additional savings may be available by implementing smaller, more efficient hybrid cars, some of which have fold down rear seating, allowing for increased space for cargo storage. All hybrid cars have standard front wheel drive

capability. A full detailed list of available 2014 model hybrid electric cars is provided in Table 1 (luxury hybrids were excluded). The manufacturer suggested retail price (MSRP) listed is for the basic model trim.

Table 1: Available 2014 Hybrid Electric Cars (Excluding Luxury Models)

Make	Model	Passenger Seating	Cargo Volume [cubic ft] (Seats Up/Seats Down)	MPG (City/Highway)	Drive	MSRP
Ford	C-Max Hybrid	5	24.5/52.6	45/40	FWD	\$25,200
Ford	Fusion Hybrid	5	12	47/47	FWD	\$26,200
Toyota	Prius	5	21.6	51/48	FWD	\$24,200
Toyota	Prius V	5	34.3	44/40	FWD	\$26,750
Toyota	Camry Hybrid	5	15.4	43/39	FWD	\$26,140
Honda	Civic	5	10.7	44/44	FWD	\$24,360
Honda	Insight	5	15.9/31.5	41/44	FWD	\$18,600
Honda	Accord	5	12.7	50/45	FWD	\$29,155

The market for hybrid electric trucks is very limited due to the added cost of robust equipment necessary to handle the payloads that pickup trucks regularly experience. Although a hybrid electric pickup truck would have better fuel economy (upwards to 50%) than its gasoline counterparts, the incremental cost for the electrical system is relatively high. There are currently only two hybrid electric trucks for the 2013 model year, both of which will not be offered for the 2014 model year. However, hybrid electric trucks may be offered in the future on GM’s new pickup chassis (new for 2014) and an analysis was completed in the event that the City of Westminster would consider these vehicles at that time. The existing specifications for the 2013 model year lineup of hybrid electric trucks is shown in Table 2, it is assumed that the specifications would be similar for any future models.

Table 2: Available Hybrid Electric Pickup Trucks (2013)

Make	Model	Passenger Seating	Cargo Volume [cubic ft]	MPG (City/Highway)	Drive	MSRP
GMC	Sierra Hybrid	6	53.2	20/23	RWD/4WD	\$41,555
Chevrolet	Silverado 1500 Hybrid	5	53.2	20/23	RWD/4WD	\$41,135

Hybrid electric sport utility vehicles (SUVs) are available in a variety of sizes, ranging from large, truck based vehicles to smaller crossover vehicles based on car chassis. Current SUVs utilized by the City of Westminster range from larger, body on frame (similar to pickup trucks) vehicles to smaller car based SUVs and would likely have to be replaced by a comparable hybrid electric models. However, replacing larger vehicles with smaller hybrid electric SUV options may provide even greater fuel savings due to both hybridization and decreased engine size. The 2014 model year has four non-luxury hybrid electric SUVs to choose from, as shown in Table 3.

Table 3: Available 2014 Hybrid Electric SUVs (Excluding Luxury Models)

Make	Model	Passenger Seating	Cargo Volume [cubic ft] (Seats Up/Seats Down)	MPG (City/Highway)	Drive	MSRP
Chevrolet	Tahoe Hybrid	9	16.9/108.9	15/21	RWD	\$43,600
Nissan	Pathfinder Hybrid	7	16.0/79.8	20/26	FWD	\$28,850
Toyota	Highlander Hybrid	7	10.3/94.1	28/28	AWD	\$40,170
Subaru	XV Crosstrek Hybrid	5	22.3/51.9	29/33	AWD	\$25,995

Hybrid Electric Economic Analysis

Hybrid electric vehicle technology typically has high incremental cost due to the complex propulsion and energy storage systems required, particularly for larger vehicles. The ½ ton hybrid electric pickups (which are not in production after 2013 but are expected to be offered again in the future) have an incremental cost of approximately \$12,200 and are predicted to provide 20 mpg (vs. current average of 13.1 for ½ ton pickups). The only large hybrid electric SUV, Chevrolet Tahoe, has an extremely high incremental cost of over \$21,000 and is advertised to provide an average 20 mpg during operation (vs. current average of 13.4 for large SUVs). As the Escape hybrid is no longer in production, smaller SUVs could likely be replaced with a Subaru XV Crosstrek Hybrid (\$6,000 incremental cost as compared to a conventional small SUV) and could provide 30 mpg (vs. current average of 19.2 for small SUVs). The incremental cost for hybrid cars was calculated based on an average for the Camry, Fusion, and Malibu (available hybrid mid-size sedans) and resulted in an average incremental cost of \$5,800. On average, a hybrid electric car is expected to achieve 44 mpg as compared to the current conventional fleet average for cars at 21.4 mpg.

Hybrid passenger cars could see a return on investment in approximately 7 to 70 years. At current utilization rates and without financial assistance, hybrid electric pickup trucks used in some of the City of Westminster’s fleet could have estimated payback periods as low as 10 years, but for many applications the payback is outside expected lifetimes (average is 34 years). Hybrid electric SUV payback periods for comparably sized models could be as low as 7 years for some replacements, but are typically much more. The reasonably attractive payback periods for some vehicles are the result of relatively high utilization levels for particular vehicles. Increases in fuel costs will have a favorable impact on payback as well, as shown in Figure 3 for a typical car operated by the City of Westminster. Certain vehicles within the fleet are rarely used and would not be good candidates for this technology. The individual payback vs. utilization data for each of the vehicles with data reported by the City of Westminster is shown in Figure 4 based on 2012 fuel costs (a list of viable replacement vehicles is included in the Appendix).

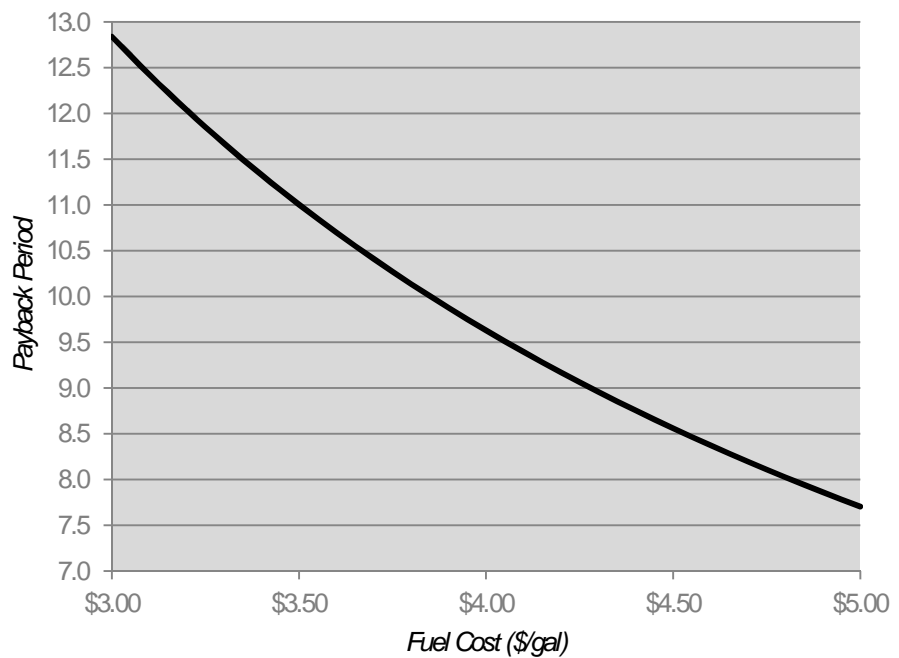


Figure 3: Payback vs. Fuel Cost for Average Car

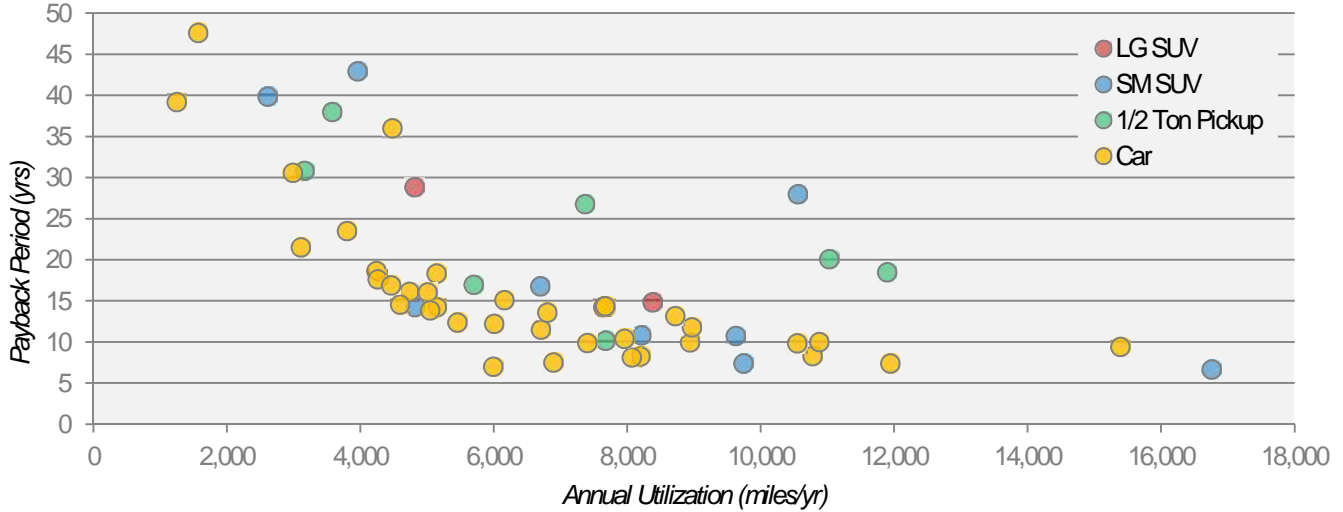


Figure 4: Hybrid Payback Period vs. Vehicle Annual Utilization

Additional fuel savings may also be possible by downsizing vehicle types employed by various fleets. The City of Westminster currently has 14 hybrid electric Toyota Priuses that get an average of 43 mpg, more than double the fuel efficiency of other cars in the fleet. The Prius is smaller than all other passenger cars in the fleet and likely replaced a larger vehicle. Some of the smaller hybrid electric SUVs have considerably better fuel economy than the larger hybrid electric Tahoe at a lower initial cost, so any conventional SUV or pickup that could be replaced by one of these vehicles would have much shorter payback periods.

Hybrid Electric Emission Savings

Due to the reduced fuel consumption from using hybrid electric vehicles, carbon dioxide (CO₂) emissions are also significantly reduced. On average, each hybrid electric pickup truck would potentially reduce CO₂ production by 1.6 tons, a hybrid electric large SUV would save 1.4 tons, a hybrid electric small SUV would save 1.4 tons, and a hybrid electric car would reduce 1.5 tons annually. The estimated annual CO₂ offset vs. potential payback period, as well as the relative incremental cost (size of each bubble) is shown in Figure 5 for each vehicle.

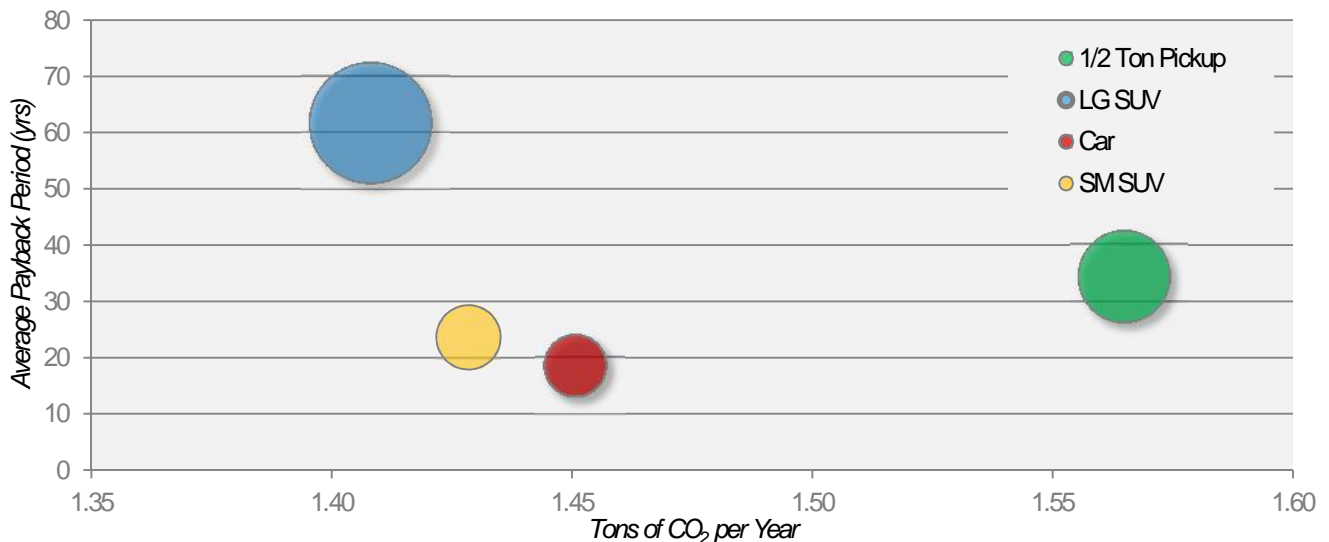


Figure 5: HEV CO₂ Emissions Offset, Payback Period, and Incremental Cost

Plug-in Hybrid Electric Technology

Plug-in electric vehicles (PEVs), including both plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs), would have lower operating costs than hybrid electric vehicles (and much lower than conventional internal combustion engine vehicles) because they use electricity to displace petroleum fuels for all or part of each trip. PHEVs are slightly more expensive than HEVs and they do require charging infrastructure which can be costly (additional information on electric vehicle charging infrastructure is included in the appendix). BEVs may have limited success in larger fleets due to their operational restrictions. A BEV’s limited range and extended recharge times can reduce the overall utilization potential, which limits the fuel savings available and extends the payback of the vehicle. However, city divisions that require frequent, relatively short (<50 mile) trips between known locations where charging infrastructure could be located may have significant fuel cost reductions that could offset the incremental cost over the life of the vehicle. Based on the annual data provided by the City of Westminster, it is not possible to evaluate the typical trip length and the viability of a BEV’s typical range. However, if the typical trip duration is short enough to accommodate fully electric vehicles, they do have the potential to provide savings for the fleet. BEV technology has the ability to offset significant amounts of greenhouse gas emissions from the vehicles it replaces. In some situations, the positive image portrayed by using green technology when coupled with incentives and funding that may be available to lower the initial cost, can justify the use of PEVs. Another way to increase the value of a PEV acquisition would be to place the charger where it could be used by the public during the day and the fleet vehicles at night. However, strictly based on economics PEVs would not be beneficial without additional funding to offset the initial cost of the vehicle or charging station.

Applicable Plug-in Hybrid Electric and Battery Electric Vehicle Models

Plug-in hybrid electric vehicles are available in either parallel or series drivetrain configurations. Parallel drive systems used in PHEVs are very similar to conventional hybrid electric vehicles but include larger battery energy storage to allow extended all electric range. Parallel configurations result in a decrease in total power when in electric only mode as both the internal combustion engine and electric motor are required for full power. Currently available parallel PHEVs that are viable for the City of Westminster’s fleet include the Ford C-Max Energi, Ford Fusion Energi, and the Toyota Prius Plug-in. Series PHEV models have no mechanical connection between the internal combustion engine and the driven wheels and rely completely on the electric motor for propulsion. Full power is available in electric mode on these vehicles. When the onboard battery pack requires charge, the onboard internal combustion engine starts and acts as a generator, providing electric power to the battery. The only viable series PHEV option for the city is the Chevrolet Volt. Details on each of the potential PHEV models that could be utilized by the city are included in Table 4.

Table 4: Plug-in Hybrid Electric Car Options

Make	Model	Passenger Seating	MPGe (City/Highway)	Cargo Volume [cubic ft] (Seats Up/Seats Down)	Drive	MSRP
Ford	C-Max Energi	5	108/92	24.5/52.6	FWD	\$32,950
Ford	Fusion Energi	5	108/92	8.2	FWD	\$38,700
Chevrolet	Volt	4	98	10.6	FWD	\$34,185
Toyota	Prius Plug-In	5	95/50	21.6	FWD	\$29,990

Battery electric vehicles do not include an internal combustion engine and use a battery to store the electrical energy to power the electric propulsion motor. Because BEVs use no other fuel, widespread use of these vehicles could dramatically reduce petroleum consumption. There are three BEVs commercially available for the 2014 model year for fleet use as shown in Table 5.

Table 5: Battery Electric Car Options

Make	Model	Passenger Seating	MPGe (City/Highway)	Cargo Volume [cubic ft] (Seats Up/Seats Down)	Drive	MSRP
Nissan	Leaf	5	129/102	24.0/30.0	FWD	\$31,770
Ford	Focus	5	110/99	14.5/33.9	FWD	\$35,751
Mitsubishi	i-Mev	4	126/99	13.0	RWD	\$29,900

Plug-in Vehicle Economic Analysis

The significant incremental cost associated with PEVs can reduce the viability of this type of vehicle for some fleets. However, the Charge Ahead Colorado program, implemented by Clean Air Fleets, provides funding to offset up to 80% of the incremental cost of PEV vehicles and the charging infrastructure required for their operation. This incentive decreases the implementation costs of PEV technology to a level that has the potential to provide savings over the price of the vehicles in some applications. Vehicle utilization levels are still important for economic viability as many fleet cars see extremely light utilization which would not provide significant enough savings for this investment. The overall economic values used for this evaluation are shown in Table 6.

Table 6: PEV Cost and Efficiency Factors

	<i>PHEV Incremental Cost</i>	<i>Charging Station Cost</i>	<i>Incentives</i>	<i>Cost per Vehicle</i>	<i>PHEV MPG</i>	<i>PHEV Payback</i>
Hybrid Vehicles	\$5,700	\$5,000	\$13,600	-\$2,900	98.0	N/A
Mid-Size Sedan	\$12,000	\$5,000	\$13,600	\$3,400	98.0	10.2
	<i>BEV Incremental Cost</i>	<i>Charging Station Cost</i>	<i>Incentives</i>	<i>Cost per Vehicle</i>	<i>BEV kWh/M</i>	<i>BEV Payback</i>
Hybrid Vehicles	\$9,000	\$5,000	\$20,000	-\$6,000	0.3	N/A
Mid-Size Sedan	\$20,000	\$5,000	\$20,000	\$5,000	0.3	15.3

When the cost and efficiency data provided above is applied to the current vehicles in the Westminster fleet, approximately 39% of the mid-size sedans are viable candidates for PHEV technology and 26% are viable for BEV technology (meaning they provide a payback period within the vehicle life of 10 years). The potential for PHEVs and BEVs compared to existing hybrid vehicles was also evaluated and, due to the incentives available for PEVs, they are available to the city at a lower incremental cost than current hybrid vehicles and would save additional fuel costs annually. The overall utilization and payback periods for the existing mid-size sedans if replaced with PHEV or BEV technology is shown in Figure 6. If the current incentives were not available for the purchase of these vehicles, the effective payback periods would increase by 400% and no cars would provide a return on investment at current utilization levels, within their lifetime for the acquisition of PHEV or BEV technology.

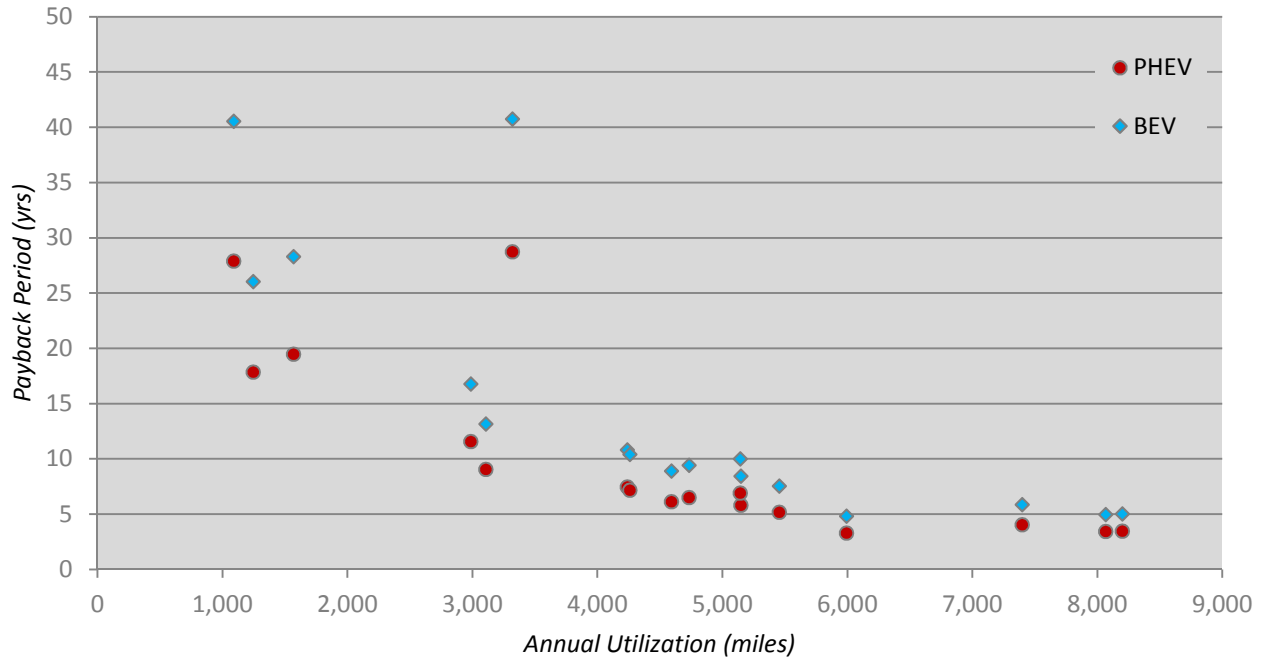


Figure 6: Plug-in Vehicle Payback Period vs. Annual Utilization

Plug-in Vehicle Emission Savings

The exact emission savings that can be expected from the use of PHEVs is highly dependent on the mix of electricity and gasoline that is used and the specific duty cycle that the vehicle experiences. Based on published efficiency figures for BEVs and the emission factors for both gasoline and electricity in Colorado, BEVs are expected to save approximately 1.1 tons of CO₂ annually on average for each vehicle. Assuming short trip distances and mostly electric operation, PHEVs could be assumed to see similar savings.

Idle Reduction Technology

Automotive engines are designed to provide power for vehicle operations and are most efficient at relatively high speeds and loads. However, sometimes vehicles idle for extended periods of time to accommodate specific duties. Because automotive engines are not particularly efficient at low speeds and loads, large amounts of fuel can be consumed for operations that don't require the full power of the internal combustion engine (such as cab conditioning and powering electronic devices). Technologies are available that shut down the primary vehicle engine when it is not needed and some idle reduction systems even provide alternative sources of energy to operate onboard equipment for extended periods of time without using the internal combustion engine.

Applicable Idle Reduction Technology Models

Automatic stop-start systems (sometimes referred to as integrated stop-and-go (ISG) systems) shut down an internal combustion engine during stationary idling, and then restart the engine once the gas pedal is pressed. These systems can also be programmed to operate during coasting or braking. Start-stop technology is present in all hybrid electric vehicles; however car manufacturers have begun to incorporate the technology into commercial gasoline vehicles. A complete list of 2014 model year commercial vehicles with ISG systems is shown in Table 7.

Table 7: OEM Vehicles Available with Start-Stop Technology

Make	Model	Passenger Seating	Cargo Volume [cubic ft]	MPG (City/Highway)	Drive	MSRP
Ford	Fusion	5	16	22/34	FWD	\$21,900
Chevrolet	Malibu	5	16.3	25/36	FWD	\$22,140
Chevrolet	Impala	5	18.8	21/31	FWD	\$26,860
Ram	1500 HFE	2	57.5	18/25	FWD	\$28,895

There are currently two stand-alone start-stop systems that are commercially available for fleet owners. The Havis IdleRight2 (shown in Figure 7) monitors the battery voltage while the engine is shut down and the electronics are turned on. If the voltage drops below a pre-set level, it triggers the remote starter to idle the vehicle. The system then runs the engine to charge the battery, turns the vehicle off, and begins the process again. IdleRight2 is designed for simple installation and ease of use in a range of emergency and utility vehicles, as well as any other vehicle that requires the use of electronic equipment for extended periods of time. The other commercially available system is the Vanner IdleWatch idle reduction system. IdleWatch recharges batteries fully before shutting off the engine. It also enables fleets to operate AC and DC power tools and equipment from the battery when the engine is not running. IdleWatch constantly monitors the battery state-of-charge. If the battery discharges below a predetermined point, IdleWatch automatically restarts the vehicle to recharge the battery, or notifies the driver to start the vehicle’s engine or turn the equipment off. Fleets have uninterrupted AC and DC power when the auto start feature is engaged to improve worker efficiency with less on-the-job downtime. The IdleWatch system can be installed on new vehicles before delivery, or retrofitted on existing vehicles. An upgraded version, the IdleWatch2, will be available in the spring of 2014. System specifics are shown in Table 8.



Figure 7: Havis IdleRight2

Table 8: Aftermarket Start-Stop Systems

Manufacturer	Model	Type	Applicable Vehicle Types	MSRP
Havis	IdleRight 2	Stop-Start System	Police Vehicles, Fire Apparatus Vehicles, Construction Trucks w/ Warning Lights	\$350
Vanner	IdleWatch/IdleWatch 2	Stop-Start System	Police Vehicles, Fire Apparatus Vehicles, Construction Trucks w/ Warning Lights	

Auxiliary power units (APU) are portable, vehicle-mounted systems that provide power for climate control and electrical devices in trucks, locomotives, and marine vehicles without idling. Several systems are available for the commercial sector. Two systems commonly used in fleet applications are the ZeroRPM Idle Mitigation System and the Energy Xtreme Independence Package system. The controller automatically stops the engine when idle time reaches one minute and restarts the engine based on voltage and current. The system also uses the engines A/C and heat as a backup. The benefit of these systems is that they automatically maximizes fuel efficiency and manages the vehicle so the user does not have to be concerned with idle mitigation or fuel usage. ZeroRPM primarily serves the police sector, offering two different systems for use in police SUVs and patrol cars. The



Figure 8: Energy Xtreme Law Enforcement Independence Package (EXIP2)

Energy Xtreme Independence Package features different APU models for use in different vehicle applications, which a police car and SUV shown in Figure 8. Specifics on each technology are shown in Table 9.

Table 9: Auxiliary Power Unit Options

Manufacturer	Model	Type	Applicable Vehicle Types	MSRP
ZeroRPM	Idle Mitigation System	APU	Police SUV (Chevy Tahoe)	\$12,000
ZeroRPM	Idle Mitigation System	APU	Police Cars	\$8,000
Energy Xtreme	EMS4	APU	Ambulance	\$15,710
Energy Xtreme	EXIP2	APU	Police SUV & Patrol Cars	\$5,008

There are numerous commercially available fuel operated heaters for fleet owners utilize. Two main classes categorize these heaters: coolant heaters and air heaters. Coolant heaters heat the vehicle’s coolant and circulate it through the vehicle’s heating system to warm the engine and vehicle interior. Air heaters are separate, self-contained units that blow hot air directly into the vehicle interior. Webasto and Espar are the primary manufacturers of fuel operated heaters for fleets. Webasto’s coolant heaters, the Webasto Thermo Series, are compact units that are utilized in heavy duty and construction vehicles, as well as emergency response vehicles. These systems have fuel rates as low as 0.08 gallons per hour and can produce between 8,500 and 120,000 British thermal units (BTUs) per hour depending on the selected

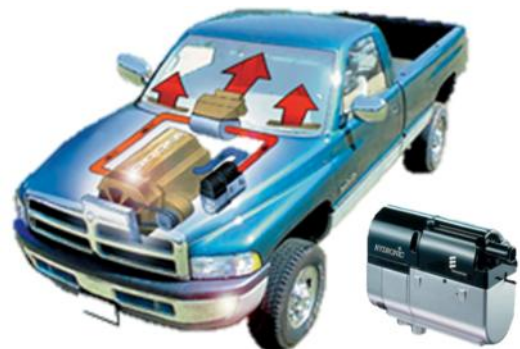


Figure 9: Espar Hydronic Series

model. Webasto offers several air heaters as well, including the most popular international model, the Air Top 2000ST. The Webasto Air Top series have fuel rates of 0.03-0.17 gallons per hour and heating capacity up to 18,700 BTU per hour. Espar, another international manufacturer of fuel operated heaters, provides its own coolant and air heater series for fleet owners (example shown in Figure 9). The Espar Hydronic series of coolant heaters are heavily used in the commercial sector, servicing delivery vans and box trucks. The larger coolant heaters in this series can be installed on construction vehicles, heavy duty trucks, and medium duty vehicles such as ambulances and emergency response vehicles. Espar’s air heaters are also utilized in such applications, as well as in lighter duty vehicles and commercial cars and trucks. Available options are shown in Table 10.

Table 10: Fuel Operated Heater Options

Manufacturer	Model	Type	Applicable Vehicle Types	MSRP
Espar	Hydronic Series	Coolant Heater	Commercial Vehicles, Heavy Duty & Construction Vehicles, Emergency Vehicles	\$1,895
Espar	Airtronic Series	Air Heater	Commercial Vehicles, On-Highway Trucks, Heavy Duty & Construction Vehicles, Emergency Vehicles	\$1,095
Webasto	Thermo Series	Coolant Heater	Commercial Vehicles, Heavy Duty & Construction Vehicles, Emergency Vehicles	N/A
Webasto	Air Top Series	Air Heater	Commercial Vehicles, On-Highway Trucks, Heavy Duty & Construction Vehicles, Emergency Vehicles	N/A

Idle Reduction Economic Analysis

The relatively low system and installation costs associated with idle reduction technology allows for attractive payback periods, assuming that idling is indeed required for the vehicle to perform its functions. This technology is generally best applied to vehicles that require stationary operation of onboard equipment, making emergency vehicles a prime application. Police vehicles, including cars and SUVs, often idle for extended periods of time to operate lights, computers, and other onboard equipment, as well as providing cab comfort. This application would benefit most from an APU because it would allow for the larger electrical draw of onboard equipment and eliminate the need for the main engine to restart as often by using a start-stop system. Ambulances could also benefit from a similar system, although a larger capacity system for longer durations and higher electrical draws would be necessary for the full benefit. Passenger cars also see fuel use reductions by using idle reduction technology. However, APUs are unnecessary for most typical passenger cars as there is not a major electrical draw from onboard equipment. For this application, a start-stop system (either OEM or aftermarket) could be utilized. As the current vehicles do not have an OEM start stop system, it is assumed that an aftermarket system could be installed. Fuel fired heaters may also prove beneficial in particular applications but because they are only useful for part of the operational season, the potential benefits are more limited. However, for vehicles primarily operated in the winter months, this may provide a viable option. The factors for the adoption of idle reduction technology for these vehicle types are shown in Table 11.

Table 11: Idle Reduction Potential for Vehicle Types

	Incremental Cost	Average MPG	Max MPG	MPG Without Idle (assumed)	Idle Time (hrs/yr)	Total Fuel Savings	Average Payback Period
PD Marked Unit	\$5,000	11	14	17	762	\$1,616	3.1
PD Marked SUV 4x4	\$5,000	10	13	13	557	\$1,100	4.5
PD Unmarked Units	\$350	11	14	17	555	\$1,096	0.3
Mid-Size Sedan	\$350	21	44	25	70	\$138	2.5
SUV 4x4	\$350	16	25	17	127	\$251	1.4

The potential for idle reduction depends on the daily operations required of a specific vehicle within the fleet. While actual idle time data was not available for this analysis, the vehicle’s achieved efficiency was compared with what is expected for that specific vehicle model to estimate the amount of idling. While the fuel economy can be influenced by the type of driving, this is a reasonable indication of how much the vehicle is idling (resulting in 0 mpg). Figure 10 plots the estimated percent of fuel consumption due to idling for individual vehicles along with its yearly mileage (a detailed listing is also included in the appendix).

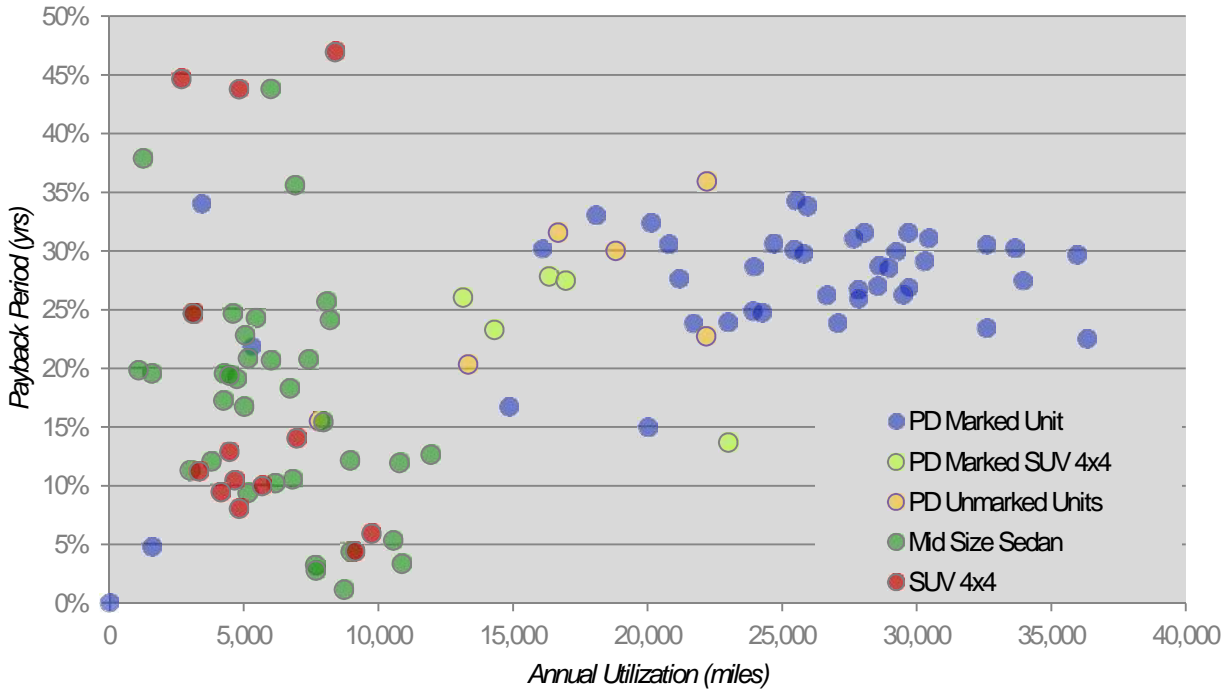


Figure 11: Fuel Consumption from Idle Percent vs. Annual Utilization

Idle Reduction Emission Savings

By eliminating fuel wasted during idling, CO₂ emissions are also reduced. Because automotive engines are designed to provide motive power for driving, they are significantly less efficient at low speeds and loads to provide idling power requirements. The potential annual CO₂ reduction per vehicle due to idle reduction is shown in Figure 11. These figures assume that vehicle idling is completely eliminated. However, at times this may not be viable and reductions will be slightly lower. A

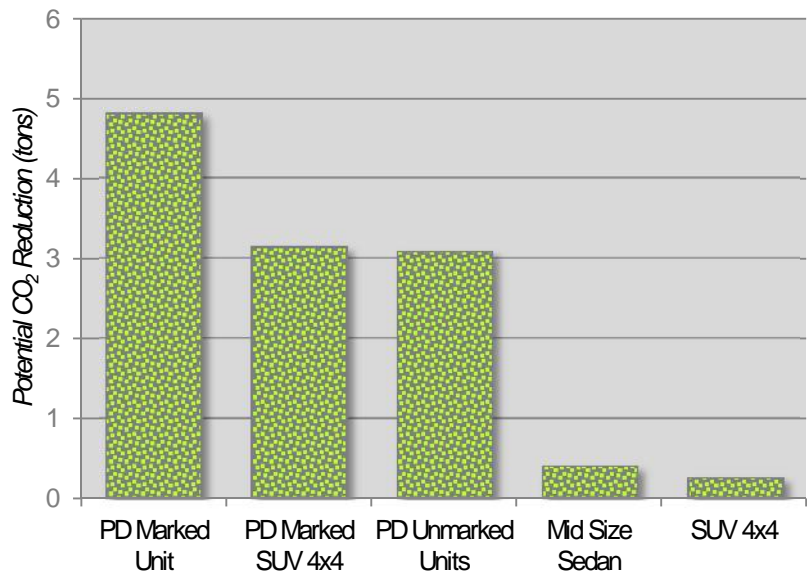


Figure 10: CO₂ Emissions Reduction Potential

complete idling evaluation, using detailed tracking of the vehicle's operation or regular downloads of engine scans that show idling times, would be required to more precisely calculate the potential savings.

Idle Reduction Case Studies

A number of case studies have been completed on the topic of idle reduction for fleets across the country. A number of methods and technologies have been employed in an attempt to reduce the amount of time vehicles are left running while stationary. Several summaries of the most applicable case studies have been included in the following paragraphs to provide information on other efforts.

CityFleet (Portland, Oregon) purchased and installed 149 Espar coolant heaters in medium and heavy duty diesel vehicles such as service trucks, dump trucks, sewer cleaning trucks, and utility trucks from 2009 to 2011. CityFleet installed the coolant heaters to reduce excessive vehicle idling times at the start of a worker's shift, on the job site, and during snow and ice events. CityFleet fully funded the installation of diesel coolant heaters through grants from the U.S. Environmental Protection Agency (EPA), American Recovery and Reinvestment Act (ARRA), Oregon Business Energy Tax Credits (BETC), and Diesel Emission Reduction Act (DERA). Coolant heaters use 0.2 gallons of fuel to start a diesel engine, while diesel engines on their own use up to 3 gallons of fuel per hour during idling. Coolant heaters warm the engine prior to starting and as a result reduce the wear and tear of the engine. CityFleet found that the coolant heaters had an average of 3.3% in fuel savings and now require all purchases of one-ton vehicle and mid-to-heavy duty trucks to be installed with coolant heaters. CityFleet noted that the coolant heater timers are difficult to reprogram after installation. Therefore, CityFleet recommends working with drivers before installing the heaters to determine the operating parameters that best meet everyone's needs.⁹

New York City Police Department (NYPD) implemented an idle reduction project as an initiative for NYC's goal of reducing idling effects on the environment as well as reducing the City's overall fuel cost. In response, NYPD purchased and installed three Energy Xtreme Independence Package (IP) units on various vehicles throughout the police department. The IP units enabled officers to operate mission critical electrical loads (lights, radio, laptop, in car video, LPR) without running the engine, significantly reducing unnecessary idling. The IP units were used from January 28, 2010 to March 3, 2010. NYPD found that the IP units saved an estimated 2.7 gallons of gasoline per vehicle per day, eliminating an estimated 52 pounds of carbon dioxide emissions per vehicle per day.¹⁰

The **Raleigh Police Department (North Carolina)** partnered with the City of Raleigh Office of Sustainability to purchase and install anti-idling technology in 29 police fleet vehicles. The partnership was in response to a commitment made by the City of Raleigh in 2008 to reduce greenhouse gas (GHG) emissions and its carbon footprint. Analysis of the technologies available led to the selection of the Energy Xtreme Independence Package (IP) for Law Enforcement. Department of Energy grant funds from Triangle Clean Cities Coalition Blue Skies Grant and the Energy Efficiency and Conservation Block Grant were used to fund this project. Installation and

⁹ DePiero, Don. CityFleet, "Green Purchasing Case Studies Diesel Coolant Heaters Warm Engines Without Idling." Last modified September 2011. www.portlandoregon.gov/bibs/article/368279

¹⁰ Burgess, Edward, Melissa Peffers, and Isabella Silverman. Environmental Defense Fund, "THE HEALTH, ENVIRONMENTAL AND ECONOMIC IMPACTS OF ENGINE IDLING IN NEW YORK CITY." Last modified February 2009. www.edf.org/sites/default/files/9236_Idling_Nowhere_2009.pdf

maintenance training was provided to vehicle fleet services in order to ensure proper installation from one vehicle into another. During the first quarter of usage, the IP Law Enforcement units saved approximately 962 gallons of fossil fuel and reduced a significant amount of GHG emissions. An initial investment of \$141,080 was made for the purchase of the units and training. A return on investment (ROI) for the units is within 2.5 years considering direct fuel savings, decreased maintenance, and extended life of the vehicle.¹¹

Technology Comparison and Conclusions

The individual technologies for the City of Westminster should be carefully evaluated on an individual vehicle basis to ensure that the adoption of a particular technology is beneficial and does not impose additional operating cost on the fleet as a whole. Some technologies may prove very beneficial for the fleet by reducing fuel costs and decreasing the CO₂ emissions of the fleet as a whole. Figure 12 is provided to show the technologies that do make sense for deployment in the City’s fleet and how they compare to other alternatives. The data provided in this graphic only includes the vehicles that have the potential to see a return on investment within the lifetime of the vehicle. The total annual CO₂ reduction (for viable vehicles) is shown on the X-axis, the average potential return on investment (ROI) (for viable vehicles) is shown on the Y-axis, and the percent of total vehicles within a particular vehicle group that could provide a ROI within their respective life span is represented by the size of the bubbles. Vehicles not economically viable and thus not included in this graphic include hybrid electric ½ ton pickup trucks, large hybrid electric SUVs, and police SUV idle reduction technology. The Figure 12 graphic is only to provide high level comparison between technologies and the detailed information contained above should be referred to for specific technology viability. Additional comparative factors are in the Figure 13 matrix.

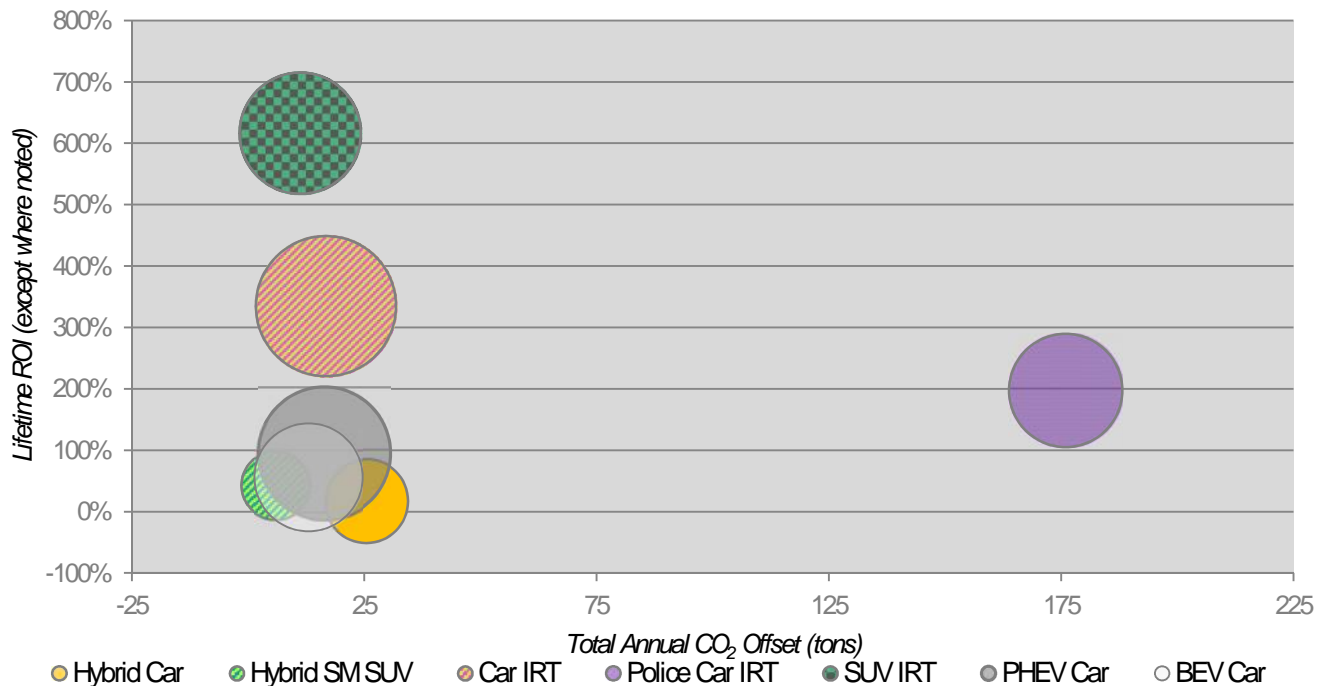


Figure 12: Vehicle Technologies Comparison

¹¹ Thomas, Paula, and Paula Stroup. Public Technology Institute, "PTI 2012-2013 Solutions Awards." Accessed November 26, 2013. www.raleighnc.gov/content/AdminServSustain/Documents/PTIRaleighPoliceAntilddingTechnology.pdf

	Focus Vehicle Types	Fleet wide Petroleum Reduction Potential	Fleet wide GHG Reduction Potential	Fleet wide Deployment Cost	Deployment Labor Time	Deployment Timeframe	Vehicle Replacement Period	Average Payback Period (years)
<i>Compressed Natural Gas</i>	Tractor Trailers	S S	R R	\$\$\$\$	High	18 months	7 yrs	N/A
	1 Ton Pickup	S S S	R R	\$\$	Medium	18 months	10 yrs	N/A
	3/4 Ton Pickup	S S S	R R	\$\$	Medium	18 months	10 yrs	N/A
	1/2 Ton Pickup	S S	R	\$\$\$	Medium	18 months	10 yrs	N/A
<i>Propane</i>	Pickup Trucks*	S S	R	\$	Medium	12 months	10 yrs	N/A
<i>Hybrid Electric</i>	1/2 Ton Pickups	S S	R R	\$\$	Low	<6 months	10 yrs	34.3
	Cars	S	R	\$	Low	<6 months	10 yrs	18.4
	LG SUVs	S	R	\$	Low	<6 months	10 yrs	50+
	SM SUVs	S	R	\$	Low	<6 months	10 yrs	23.6
<i>Plug-in Hybrid Electric</i>	Cars*	S	R	\$\$\$	Medium	12 months	10 yrs	10.2
<i>Battery Electric</i>	Cars*	S	R	\$\$\$	Medium	12 months	10 yrs	14.8
<i>Idle Reduction Technology</i>	PD Marked Car	S S S	R R	\$\$\$	Medium	<6 months	3 yrs	3.1
	PD Marked SUV	S S	R	\$\$	Medium	<6 months	3 yrs	4.5
	PD Unmarked Car	S S	R	\$	Medium	<6 months	4 yrs	0.3
	Car	S S	R	\$	Medium	<6 months	10 yrs	2.5
<i>B20 Fuel</i>	All diesel vehicles	S	R	\$	Low	<6 months	varies	N/A
<i>E85 Fuel</i>	Most light duty	S S	R	\$	Low	<6 months	varies	N/A

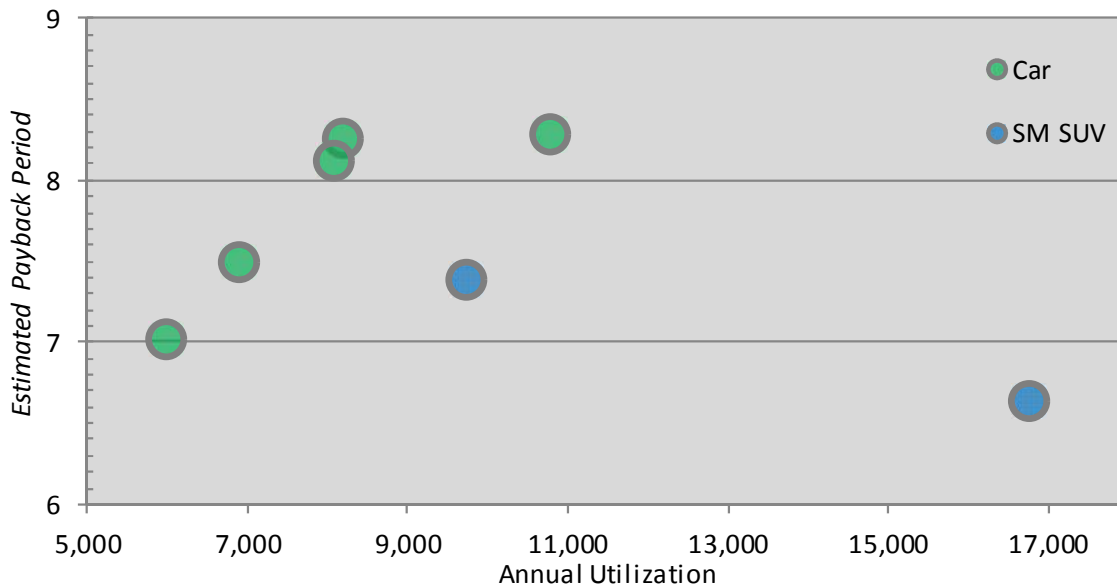
*Includes infrastructure installation costs and vehicle incremental costs (refuse and grapple trucks)

Figure 13: Potential Fleet Solution Matrix

APPENDIX A: VIABLE VEHICLES FOR HEV TECHNOLOGY

Model	Incremental Cost	Net Cost	MPG	Estimated Life	Average Payback
1/2 Ton Pickup	\$12,200	\$12,200	20.0	10.0	34.3
LG SUV	\$21,346	\$21,346	20.0	10.0	61.7
SM SUV	\$5,922	\$5,922	30.0	10.0	23.6
Car	\$5,769	\$5,769	44.3	10.0	18.4

UNIT #	DESCRIPTION	Type	Annual Fuel Use (gallons)	Annual Fuel Cost	Annual Utilization	Baseline MPG	Payback
2329	Chevrolet Malibu	Car	432	\$1,222	8,197	19.0	8.3
8009	Chevrolet Malibu	Car	426	\$1,204	5,990	14.0	7.0
8128	Chevrolet Malibu	Car	434	\$1,224	8,065	18.6	8.1
8149	Chevrolet Malibu	Car	374	\$1,057	7,397	19.8	9.9
8554	Chevrolet Malibu	Car	407	\$1,148	8,940	22.0	10.0
8556	Chevrolet Malibu	Car	489	\$1,384	10,773	22.0	8.3
8131	Chevrolet Malibu Lt	Car	446	\$1,260	10,547	23.7	9.8
8622	Chevrolet Malibu	Car	450	\$1,271	10,874	24.2	10.0
8581	Chevrolet Malibu	Car	564	\$1,593	15,390	27.3	9.4
8129	Chevrolet Malibu	Car	428	\$1,209	6,891	16.1	7.5
7731	Chevrolet Equinox	SM SUV	609	\$1,718	9,738	16.0	7.4
8130	MAZDA Cx7	SM SUV	875	\$2,464	16,757	19.1	6.6



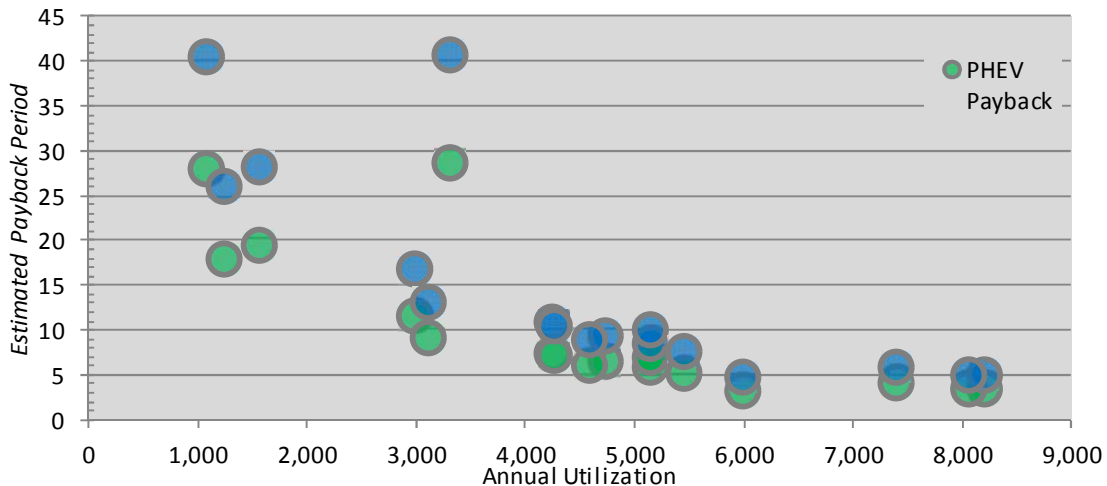
APPENDIX B: VIABLE VEHICLES FOR PHEV TECHNOLOGY

	PHEV Inc. Cost	Charging Station Cost	Incentives	Cost per Vehicle	PHEV MPG	PHEV Payback
Hybrid Vehicles	\$5,700	\$5,000	\$13,600	-\$2,900	98.0	N/A
Mid Size Sedan	\$12,000	\$5,000	\$13,600	\$3,400	98.0	10.2

	BEV Inc. Cost	Charging Station Cost	Incentives	Cost per Vehicle	BEV KWh/M	BEV Payback
Hybrid Vehicles	\$9,000	\$5,000	\$20,000	-\$6,000	0.3	N/A
Mid Size Sedan	\$20,000	\$5,000	\$20,000	\$5,000	0.3	14.8

Electricity Price \$0.09 \$/kWh

UNIT #	DESCRIPTION	Type	Annual Utilization	Annual Fuel Use (gallons)	Baseline MPG	PHEV Payback	BEV Payback
2329	Chevrolet Malibu	Car	8,197	\$432	19	3.5	5.0
2333	Chevrolet Malibu	Car	5,146	\$260	20	5.8	8.4
2419	Chevrolet Malibu	Car	4,731	\$234	20	6.5	9.4
2101	Chevrolet Malibu	Car	4,237	\$205	21	7.5	10.8
9154	Chevrolet Malibu	Car	3,317	\$76	44	28.7	40.7
8008	HONDA Accord Lx	Car	2,984	\$135	22	11.6	16.8
8150	Chevrolet Malibu	Car	5,141	\$227	23	6.9	10.0
7712	Chevrolet Malibu	Car	4,591	\$244	19	6.1	8.9
6003	Chevrolet Malibu	Car	1,245	\$80	16	17.9	26.0
9000	Chevrolet Malibu	Car	5,452	\$288	19	5.2	7.5
9007	Chevrolet Malibu	Car	1,566	\$78	20	19.5	28.3
8009	Chevrolet Malibu	Car	5,990	\$426	14	3.3	4.8
8128	Chevrolet Malibu	Car	8,065	\$434	19	3.4	5.0
8310	Chevrolet Malibu	Car	3,105	\$165	19	9.1	13.2
8149	Chevrolet Malibu	Car	7,397	\$374	20	4.0	5.9
8109	Chevrolet Malibu	Car	1,088	\$54	20	27.9	40.6
8669	Chevrolet Malibu	Car	4,257	\$212	20	7.2	10.4



APPENDIX C: VIABLE VEHICLES FOR IDLE REDUCTION TECHNOLOGY

Unit #	Description	Vehicle Type	Annual Miles	Annual Fuel Use	MPG	Idling Fuel Cost	Payback Period
8009	Chevrolet Malibu	Mid Size Sedan	5,990	426	14	\$527	7.6
8129	Chevrolet Malibu	Mid Size Sedan	6,891	428	16	\$431	9.3
8484	FORD Expedition	PD Marked SUV 4x4	16,339	1,742	9	\$1,370	2.9
8480	FORD Expedition	PD Marked SUV 4x4	16952	1,798	9	\$1,394	2.9
8729	FORD Crown Vic	PD Marked Unit	25498	2,281	11	\$2,208	1.8
8735	FORD Crown Vic	PD Marked Unit	25,912	2,302	11	\$2,200	1.8
8747	FORD Crown Vic	PD Marked Unit	18,075	1,588	11	\$1,495	2.7
8740	FORD Crown Vic	PD Marked Unit	20,095	1,748	11	\$1,612	2.5
8714	FORD Crown Vic	PD Marked Unit	29,661	2,549	12	\$2,270	1.8
8745	FORD Crown Vic	PD Marked Unit	28,024	2,408	12	\$2,160	1.8
8732	FORD Crown Vic	PD Marked Unit	30,435	2,596	12	\$2,271	1.8
8728	FORD Crown Vic	PD Marked Unit	27624	2,355	12	\$2,063	1.9
8711	FORD Crown Vic	PD Marked Unit	24663	2,091	12	\$1,809	2.2
8717	FORD Crown Vic	PD Marked Unit	20,776	1,759	12	\$1,525	2.6
8733	FORD Crown Vic	PD Marked Unit	32,602	2,760	12	\$2,383	1.7
8725	FORD Crown Vic	PD Marked Unit	33,635	2,835	12	\$2,416	1.7
8709	FORD Crown Vic	PD Marked Unit	16,099	1,356	12	\$1,166	3.4
8737	FORD Crown Vic	PD Marked Unit	25,425	2,138	12	\$1,815	2.2
8731	FORD Crown Vic	PD Marked Unit	29,221	2,453	12	\$2,071	1.9
8724	FORD Crown Vic	PD Marked Unit	25774	2,158	12	\$1,814	2.2
8727	FORD Crown Vic	PD Marked Unit	35934	3,004	12	\$2,514	1.6
8713	FORD Crown Vic	PD Marked Unit	30,272	2,511	12	\$2,058	1.9
8707	FORD Crown Vic	PD Marked Unit	28,586	2,358	12	\$1,904	2.1
8712	FORD Crown Vic	PD Marked Unit	23,930	1,973	12	\$1,592	2.5
8721	FORD Crown Vic	PD Marked Unit	28,940	2,379	12	\$1,916	2.1
8710	FORD Crown Vic	PD Marked Unit	33936	2,751	12	\$2,128	1.9
8723	FORD Crown Vic	PD Marked Unit	28531	2,299	12	\$1,750	2.3
8743	FORD Crown Vic	PD Marked Unit	29,692	2,388	12	\$1,819	2.2
8703	FORD Crown Vic	PD Marked Unit	27,811	2,230	12	\$1,670	2.4
8720	FORD Crown Vic	PD Marked Unit	29,465	2,350	13	\$1,742	2.3
8719	FORD Crown Vic	PD Marked Unit	26,656	2,124	13	\$1,570	2.5
8730	FORD Crown Vic	PD Marked Unit	27,828	2,210	13	\$1,616	2.5
8706	FORD Crown Vic	PD Marked Unit	27,059	2,090	13	\$1,407	2.8
8705	FORD Crown Vic	PD Marked Unit	32569	2,501	13	\$1,649	2.4
8738	FORD Crown Vic	PD Marked Unit	36317	2,756	13	\$1,748	2.3
8498	FORD Crown Vic	PD Marked Unit	14,841	1,048	14	\$489	8.2
8715	FORD Crown Vic	PD Marked Unit	20,008	1,384	14	\$578	6.9
8726	FORD Crown Vic	PD Unmarked Units	22,194	2,038	11	\$2,069	1.9
8492	FORD Crown Vic	PD Unmarked Units	16,676	1,434	12	\$1,279	3.1
8490	FORD Crown Vic	PD Unmarked Units	18811	1,581	12	\$1,340	3.0
2404	Chevrolet Trailblazer	SUV 4x4	4811	503	10	\$621	6.4
5117	Chevrolet Suburban	SUV 4x4	8,379	929	9	\$1,232	3.2

List is based on comparing the vehicle's actual MPG to the model's rated MPG and is only an estimate. Realtime data should be gathered to quantify the actual idling levels of the specific vehicles in the fleet and also quantify the potential savings of adopting idle reduction technology. Work trucks were not included here as the specific duty cycle and use (towing, hauling, offroad, etc...) could have significant impact on the resulting MPG.

APPENDIX D: ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) INFRASTRUCTURE

Plug-in Electric Vehicles (PEVs) require Electric Vehicle Supply Equipment (EVSE), commonly referred to as charging stations, to charge their onboard batteries. By definition, EVSE includes the conductors, PEV connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of delivering energy from the premises wiring to the PEV.

For Battery Electric Vehicles (BEVs), charging is critical as they have no other source of power, while Plug-in Hybrid Electric Vehicles (PHEVs) can operate on gasoline when the battery is depleted. The Society of Automotive Engineers (SAE) released standards for charging connection configurations and ratings. As shown in Figure 14, EVSE comes in various levels of charging, such as alternating current (AC) Level 1 (120 V AC, 12–16 A), AC Level 2 (240 V AC, up to 80 A), direct current (DC) Level 1 (200–500 V DC, up to 80 A), and DC Level 2 (200–500 V DC, up to 200 A). The EVSE rating affects charging duration and electrical demand placed on the grid.


<i>SAE International</i>			
	<p>AC level 1 (SAE J1772™)</p> <p>PEV includes on-board charger 120V, 1.4 kW @ 12 amp 120V, 1.9 kW @ 16 amp Est. charge time: PHEV: 7hrs (SOC* - 0% to full) BEV: 17hrs (SOC - 20% to full)</p>		<p>DC Level 1 (SAE J1772™)</p> <p>EVSE includes an off-board charger 200-500 V DC, up to 40 kW (80 A) Est. charge time (20 kW off-board charger): PHEV: 22 min. (SOC* - 0% to 80%) BEV: 1.2 hrs. (SOC - 20% to 100%)</p>
	<p>AC level 2 (SAE J1772™)</p> <p>PEV includes on-board charger (see below for different types) 240 V, up to 19.2 kW (80 A) Est. charge time for 3.3 kW on-board charger PEV: 3 hrs (SOC* - 0% to full) BEV: 7 hrs (SOC - 20% to full) Est. charge time for 7 kW on-board charger PEV: 1.5 hrs (SOC* - 0% to full) BEV: 3.5 hrs (SOC - 20% to full) Est. charge time for 20 kW on-board charger PEV: 22 min. (SOC* - 0% to full) BEV: 1.2 hrs (SOC - 20% to full)</p>		<p>DC Level 2 (SAE J1772™)</p> <p>EVSE includes an off-board charger 200-500 V DC, up to 100 kW (200 A) Est. charge time (45 kW off-board charger): PHEV: 10 min. (SOC - 0% to 80%) BEV: 20 min. (SOC - 20% to 80%)</p>
<p><small>Voltagages are nominal configuration voltages, not coupler ratings Rated Power is at nominal configuration operating voltage and coupler rated current Ideal charge times assume 90% efficient chargers, 150W to 12V loads and no balancing of Traction Battery Pack</small></p>			
<p><small>Notes: 1) BEV (25 kWh usable pack size) charging always starts at 20% SOC, faster than a 1C rate (total capacity charged in one hour) will also stop at 80% SOC instead of 100% 2) PHEV can start from 0% SOC since the hybrid mode is available.</small></p>			
			<small>ver. 100312</small>

Figure 14: SAE Charging Configuration and Ratings Terminology

Level 1 Charging is limited to 120VAC and can use a typical household three-prong plug. The majority of current EVs are sold with a level 1 capabilities and do not require the installation of any additional infrastructure. Because of the low power and long charge times associated with level 1 EVSE, it is generally only used for home charging applications where long recharge times overnight are viable, although some workplace settings may be appropriate for level 1 EVSE since the cars are parked there the majority of the day. Level 2 Charging provides electrical energy through either 240VAC (typical for residential applications) or 208VAC (typical in commercial and industrial applications). This level of charging is appropriate for public charging locations where the PEV may

be parked for 1-2 hours. The increased charging rate and affordability of level 2 EVSE systems make them the most popular choice for all EV charging applications. DC Levels 1 and 2 “Fast Charging” utilizes a direct-current energy transfer and a 480VAC input to provide extremely rapid recharges at heavily used public charging areas or along highways. The significant cost associated with this form of EVSE has limited its deployment, but it can provide an 80% recharge in as little as 20 minutes which significantly increased the viability of electric vehicles.

The PEV connector is a device that, by insertion into a PEV inlet, establishes an electrical connection to the PEV for the purpose of energy transfer and information exchange. SAE has established a standard for the PEV connector, J1772. Shown in Figure 15, this connector has 5 pins: 2 pins for power (AC Line 1 & AC Line 2/neutral), one ground pin (first to engage and last to disengage for safety), one proximity detection pin (prevents the car from moving while charging), and one control pilot pin (last to engage and first to disengage, communicates charge rate available to determine amount of current allowed for the vehicle being charged).

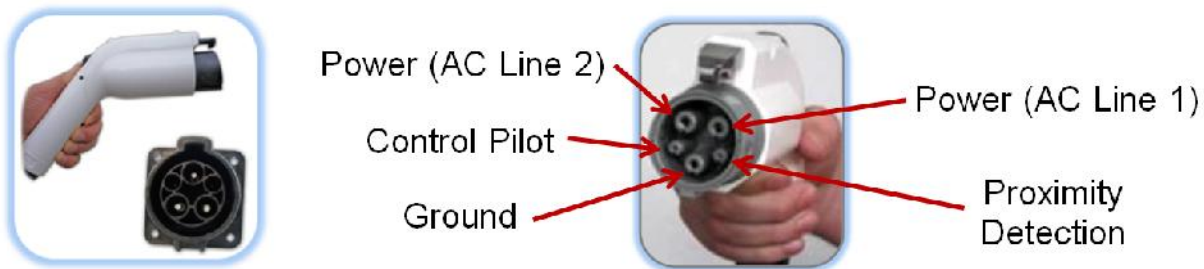


Figure 15: SAE J1772 PEV Connector

There are several EVSE manufacturers with commercially available charging stations. Some charging stations are very simplified and low cost, providing a powered J1772 PEV connector on an elevated mount so the cord can be wrapped up. However, the majority of the EVSE manufacturers produce a charging station with many more user-friendly amenities. Networked EVSE have the capability to integrate payments, restrict access to PEV connector until a proper user is identified by an RFID reader, remotely track usage, allow others to see when it is available, or reserve the station for their future use. While many of these features are convenient for the EV drivers, there is a monthly subscription fee to support these services which adds costs. The most common charging station configuration is a pedestal, an example of which is shown in Figure 16, although pole mount configurations are useful in certain environments and are an option from most manufacturers. Some of the major EVSE manufacturers and level 2 models include;

- Bosch Power Xpress Bollard,
- Chargepoint CT4000 Series,
- Clipper Creek CS-40/CS-100,
- EVSE LLC Curbside/Industrial,
- Eaton Level 2 EVSE,
- GE WattStation,
- Leviton, and
- Schneider Electric EVLink Outdoor Charger.



Figure 16: Pedestal EVSE

ABB, Aerovironment, Eaton, Fuji Electric, and Schneider Electric all manufacture DC fast charge EVSE. Wireless EV charging is a relatively new technology that allows power transfer across an air gap, using a magnetic field to safely charge EVs without the hassle of cables. This requires installations on both the vehicle and the pavement, and a method to ensure proper vehicle alignment over the charging pad. There are several power levels available (between 3.3 kW and 20 kW), depending on the manufacturer and vehicle. The key advantage to wireless charging is that a driver only needs to park over the charger (no “plugging in” necessary) and the system simply shuts off when the driver drives away. The key disadvantage lies in charging efficiency; an average wireless system will perform at around 90% efficiency while comparable conductive (plugin) chargers reach around 96%. Several wireless charging manufacturers are currently developing and testing their products in limited demonstrations, including;

- Bombardier,
- HEVO Power,
- Momentum Dynamics,
- Qualcomm Halo,
- Plugless Power,
- Wireless Advanced Vehicle Electrification (WAVE), and
- Witricity.

PEVs bring with them the classic “chicken and egg” argument over whether the cars or infrastructure is needed first to stimulate the other’s deployment. To address consumers’ worries about range anxiety and to promote the use of domestically produced electricity, the federal government, several states, and private investors are supporting the installation of public EVSE.

Siting EVSE effectively, so it is most useful for current and future PEV owners, requires prioritizing EVSE locations in certain contexts. Numerous studies have reached the following conclusions regarding the use of EVSE by future PEV owners:

- A single battery charge can easily accommodate typical automobile tours. This includes all of the trips made while away from home, such as commuting to work and running errands along the way.
- The majority of charging will occur at home; the second-highest percentage will occur at work.
- Public charging will largely involve “topping off” the battery.
- PEV owners will likely be more concerned about non-typical travel, giving importance to “safety-net” charging sites. The availability of a network of public charging stations tends to increase drivers’ willingness to use their PEV batteries more fully, but an increase in EVSE usage will not necessarily occur.

To fully benefit the PEV ecosystem, EVSE installations should be concentrated where current and projected PEV owners will be travelling. Public EVSE should also be located in high-visibility places, increasing usage by current PEV owners and persuading potential owners that there are sufficient public opportunities, even if the owners may not use the EVSE in question. There are several different EVSE installation configurations, varying in size, mounting approach, proximity to power, parking space dimensions, and number of cord sets. For the City of Westminster, the primary function of the charging stations would be for its fleet-owned PEVs. However, funding incentives, which the City should try to utilize, would likely require the stations to have public access. Since the City vehicles would only need to use the charging stations overnight, making them available to the public during the day would optimize the use of this infrastructure and support the use of PEVs in the community.

The ideal location for installing these stations for both the City fleet and public use would be at the City Hall. In addition to this parking lot being shared by the City fleet and the public, EVSE would be a good complement to the PV array that has already been installed. Figure 17 outlines some parking spaces that are best suited for EVSE installation, primarily due to their proximity to the building which would shorten the electricity run and lower the cost.

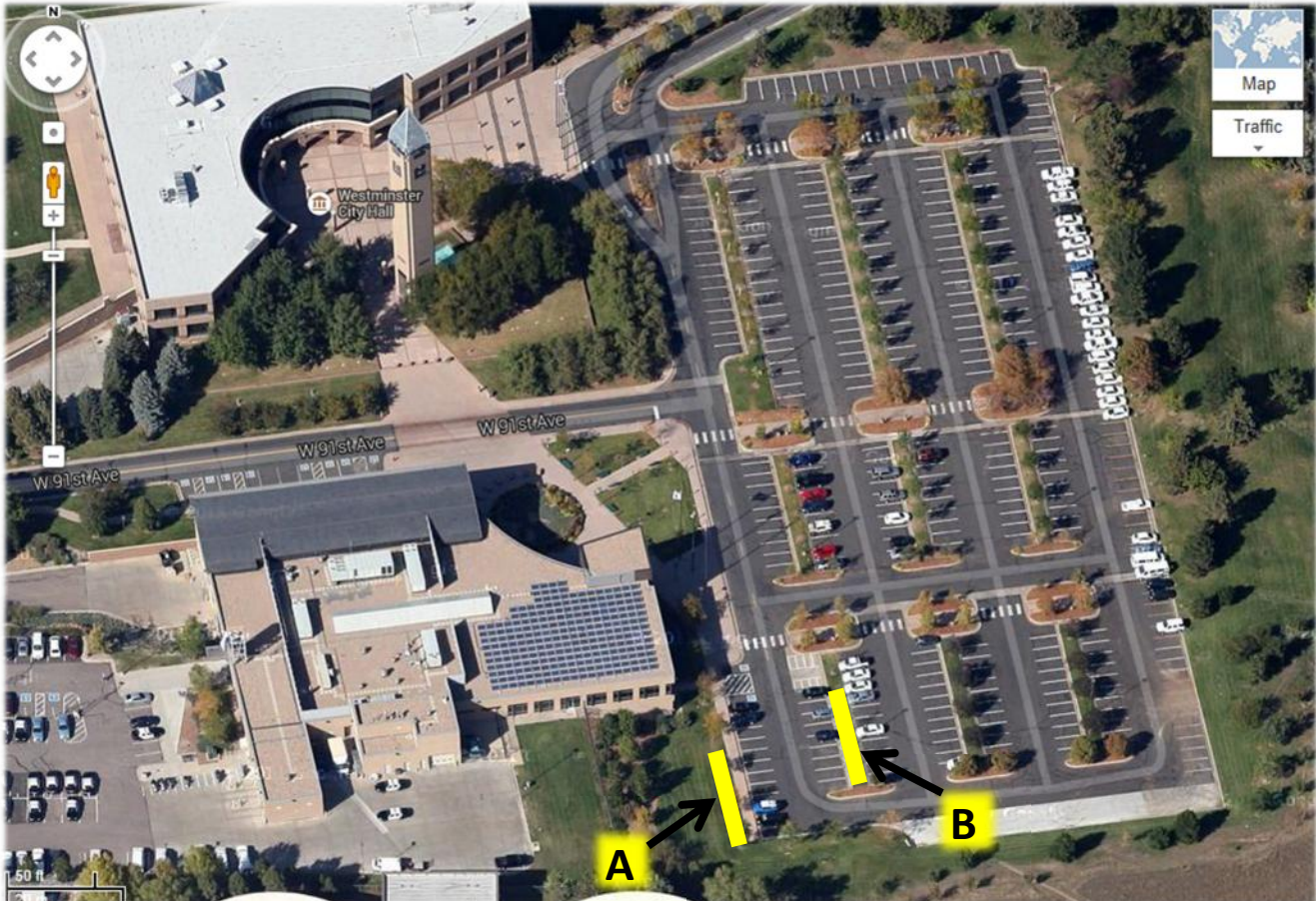


Figure 17: Potential EVSE Installation Locations

Location A would require the shortest wire run and least trenching (all of which is through grass) to get power from the building. Location B would require trenching under existing pavement, which is feasible, but the farther distance will add costs. The advantage of location B is that city PEVs could have reserved spots on one side of the chargers and the other side could be reserved for public EVSE. This provides more flexibility in use of the stations, whereas in location A, the city PEVs would be required to vacate these parking spaces every morning for public use, and might not be permitted to park there until after work hours. This would mean additional vehicle management.

EVSE costs and their installation can vary greatly. Additional features with the EVSE, particularly ones that require a subscription fee, will increase the initial and ongoing costs for the hardware. The cost of the installation is primarily driven by the length of the wire run from an existing electrical panel, but can also be influenced by the complication of the installation (digging under pavement, getting the electricity out of the

building, etc.). The exact location of the electrical power in the building is not known, which could determine whether locations A or B were economically feasible, and it is also unknown whether there is sufficient additional capacity in the electrical panel, which would also add additional costs. Under the assumption that an electrical panel with sufficient available power is in close proximity to the proposed installation locations and that multiple EVSE will be installed at this location (2-4 double pedestals for a total of 4-8 available charging ports), the estimated installed cost for a typical level 2 station is \$5,000. Subscription fees would be in addition to this if the City selected the option for web-based monitoring or payments. EVSE installed at the City's Municipal Service Center only for city-owned PEVs and without any special features might be slightly less, but again it depends on the wire run and number of stations that are installed.



WESTMINSTER

Staff Report

Information Only Staff Report
March 24, 2014



SUBJECT: Monthly Residential Development Report

PREPARED BY: Walter G. Patrick, Planner

Summary Statement

This report is for City Council information only and requires no action by City Council.

- The following report updates 2014 residential development activity per subdivision (please see attachment) and compares 2014 year-to-date totals with 2013 year-to-date totals.
- The table below shows an increase in new residential construction for 2014 year-to-date totals when compared to 2013 year-to-date totals (7 units in 2014 vs. 0 units in 2013).
- Residential development activity for the month of February 2014 versus February 2013 reflects an increase in single-family detached (5 units in 2014 versus 0 units in 2013), and no change in single-family attached, multiple-family, or senior housing (0 units in both years).

NEW RESIDENTIAL UNITS (2013 AND 2014)

UNIT TYPE	FEBRUARY		<u>% CHG</u>	YEAR-TO-DATE		<u>% CHG</u>
	2013	2014		2013	2014	
Single-Family Detached	0	5	-	0	7	-
Single-Family Attached	0	0	-	0	0	-
Multiple-Family	0	0	-	0	0	-
Senior Housing	0	0	-	0	0	-
TOTAL	0	5		0	7	

Background Information

In February 2014, there were 5 Service Commitments issued for new housing units.

The column labeled “# Rem.” on the attached table shows the number of approved units remaining to be built in each subdivision.

Total numbers in this column will change as new residential projects (awarded Service Commitments in the new residential competitions), Legacy Ridge projects, build-out developments, etc., receive Official Development Plan (ODP) approval and are added to the list. Conversely, projects with expired Service Commitments are removed from the list.

This report supports the City Council Strategic Plan goals of Strong Balanced Local Economy, Financially Sustainable City Government Providing Exceptional Services, and Vibrant Neighborhoods in One Livable Community.

Respectfully submitted,

J. Brent McFall
City Manager

Attachment – Active Residential Development Table

ACTIVE RESIDENTIAL DEVELOPMENT

Single-Family Detached Projects:

Bradburn (120th & Tennyson)
CedarBridge (111th & Bryant)
Country Club Highlands (120th & Zuni)
Countryside Vista (105th & Simms)
Huntington Trails (144th & Huron)
Hyland Village (96th & Sheridan)
Legacy Ridge West (104th & Leg. Ridge Pky.)
Lexington (140th & Huron)
Various Infill
Winters Property (111th & Wads. Blvd.)
Winters Property South (110th & Wads. Blvd.)

Jan-14	Feb-14	2013 YTD	2014 YTD	# Rem.*	2013 TOTAL
0	0	0	0	0	6
0	0	0	0	3	0
2	4	0	6	64	8
0	0	0	0	9	0
0	1	0	1	22	10
0	0	0	0	105	0
0	0	0	0	0	1
0	0	0	0	2	1
0	0	0	0	8	7
0	0	0	0	8	0
0	0	0	0	10	0
2	5	0	7	231	33

SUBTOTAL

Single-Family Attached Projects:

Alpine Vista (88th & Lowell)
Cottonwood Village (88th & Federal)
East Bradburn (120th & Lowell)
Hollypark (96th & Federal)
Hyland Village (96th & Sheridan)
Legacy Village (113th & Sheridan)
South Westminster (East Bay)
Shoenberg Farms
Summit Pointe (W. of Zuni at 82nd Pl.)
Sunstream (93rd & Lark Bunting)

0	0	0	0	84	0
0	0	0	0	62	0
0	0	0	0	117	0
0	0	0	0	58	0
0	0	0	0	153	0
0	0	0	0	30	24
0	0	0	0	53	0
0	0	0	0	8	0
0	0	0	0	58	0
0	0	0	0	10	4
0	0	0	0	633	28

SUBTOTAL

Multiple-Family Projects:

Hyland Village (96th & Sheridan)
Orchard at Westminster
Prospector's Point (87th & Decatur)
South Westminster (East Bay)
South Westminster (Harris Park Sites I-IV)

0	0	0	0	54	0
0	0	0	0	194	200
0	0	0	0	24	0
0	0	0	0	28	0
0	0	0	0	6	0
0	0	0	0	306	200

SUBTOTAL

Senior Housing Projects:

Crystal Lakes (San Marino)
Mandalay Gardens (Anthem)

0	0	0	0	7	0
0	0	0	0	0	60
0	0	0	0	7	60

SUBTOTAL

TOTAL (all housing types)

2	5	0	7	1177	321
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* This column refers to the number of approved units remaining to be built in each subdivision.