# IMPACT FEE STUDY

*Prepared for*

*West Jordan, Utah*

**September 26, 2016**

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TischlerBise, Inc. certifies that the attached impact fee analysis:

1. includes only the costs of public facilities that are:
    a. allowed under the Impact Fees Act; and
    b. actually incurred; or
    c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
    a. costs of operation and maintenance of public facilities;
    b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents;
    c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement;
3. offsets costs with grants or other alternate sources of payment; and
4. complies in each and every relevant respect with the Impact Fees Act.

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# Executive Summary

## OVERVIEW

The City of West Jordan, Utah, has retained TischlerBise to determine growth-related infrastructure needs and calculate development impact fees for the following infrastructure categories:

- Parks
- Fire
- Police
- Water
- Wastewater
- Storm Drainage
- Transportation

Impact fees are one-time payments used to construct system improvements needed to accommodate development. Impact fees for West Jordan are proportionate and reasonably related to the capital facility service demands of new development. Impact fees are necessary to achieve an equitable allocation of capital costs, in comparison to past and future benefits. West Jordan has complied with all requirements of Utah's Impact Fees Act.

After discussions with City staff, TischlerBise determined demand indicators for each type of public facility and calculated residential and nonresidential proportionate share factors. These factors are used to allocate costs by type of development. The formulas used to calculate the impact fees for the City of West Jordan are diagrammed in a flow chart for each type of public facility in each respective chapter of this report. Also contained in this report are summary tables indicating the specific level of service (LOS) or infrastructure standards used to derive the impact fees.

## IMPACT FEE METHODOLOGIES

There are three basic methods used to calculate the impact fees. The **incremental expansion** method documents the current LOS for each type of public facility in both quantitative and qualitative measures. This method is best suited for public facilities that will be expanded incrementally in the future, with LOS standards based on current conditions in the community. The **plan-based** method is best suited for public facilities that have adopted plans or commonly accepted engineering standards to identify the need for capital projects. A **cost recovery** method may be used for facilities that have been oversized to accommodate future development, at least for the next six years. The rationale for the cost recovery approach is that new development is paying for its share of the useful life or remaining capacity of the existing facility. To the extent that new growth and development is served by the previously constructed improvements, Utah's Impact Fee Act allows the City to be reimbursed for the previously incurred public facility costs [see 11-36a-304].

Another general requirement that is common to impact fee methodologies is the evaluation of credits. Past and future revenue credits have been evaluated to avoid potential double payment situations arising from the payment of a one-time impact fee and then subsequent payments of other revenues that may also fund growth-related capital improvements. General Fund revenues, such as property taxes, being used for parks and police improvements have been accounted for in credits for future principal payments.

## SUMMARY OF CURRENT AND PROPOSED IMPACT FEES

For comparison purposes, West Jordan's current impact fees are shown in Figure 1.

### Figure 1. Current Impact Fees

| *Residential (per housing unit)* | *Parks** | *Fire* | *Police* | *Water* | *Sewer* | *Storm Drainage* | *Transportation* | *Total*** |
|---|---|---|---|---|---|---|---|---|
| Single Family | $2,070 | $138 | $134 | $1,922 | $1,333 | Per Acre | $3,577 | $9,174 |
| Multifamily | $1,374 | $92 | $89 | $1,276 | $885 | Per Acre | $1,742 | $5,458 |
| ***Nonresidential (per 1,000 Sq. Ft.)*** | | | | | | | | |
| Commercial | - | $122 | $182 | Per Meter | Per Meter | Per Acre | $4,163 | $4,467 |
| Office | - | $203 | $71 | Per Meter | Per Meter | Per Acre | $1,784 | $2,058 |
| Industrial | - | $179 | $52 | Per Meter | Per Meter | Per Acre | $1,314 | $1,545 |

*Charged only for residential development

**Not including Stormwater for the residential categories and Storm Drainage, Water, and Sewer for the nonresidential categories

Figure 2 shows the method used to derive each type of fee in West Jordan, plus each component that contributes to the impact fee.

### Figure 2. Proposed Impact Fees: Methods and Cost Components

| *Type of Fee* | *Cost Recovery (past)* | *Incremental Expansion (present)* | *Plan-Based (future)* | *Cost Allocation* |
|---|---|---|---|---|
| 1. Parks | | Park Land Acquisition and Development, Recreation Improvements, and Trails | Recreation Center | *Population* |
| 2. Fire | Fire Station Space | | | *Calls for Service* |
| 3. Police | | Police Station Space | | *Functional Population* |
| 4. Water | | | Wells & Pump Stations, Reservoirs, Transmission | *Average Day Water Demand* |
| 5. Wastewater | SVWRF Debt Service | | Collection System Improvements | *Average Day Wastewater Demand* |
| 6. Stormwater | Culverts | | System Improvements | *Acreage* |
| 7. Transportation | Developer Reimbursements | | Road Improvements and Signalized Intersections | *Average Weekday Vehicle Trips* |

Figure 3 provides a summary schedule of the proposed development impact fees for West Jordan. Fees for residential development are per housing unit and fees for nonresidential development are per 1,000 square feet of floor area.

### Figure 3. Proposed Impact Fees

| Residential (per housing unit) | Parks* | Fire | Police | Water | Sewer | Storm Drainage | Transportation | Total** |
|---|---|---|---|---|---|---|---|---|
| Single Family | $3,367 | $34 | $203 | $2,220 | $1,931 | Per Acre | $2,261 | $10,016 |
| Multifamily | $1,925 | $20 | $116 | $982 | $855 | Per Acre | $1,336 | $5,234 |
| **Nonresidential (per 1,000 Sq. Ft.)** | | | | | | | | |
| Commercial | - | $159 | $118 | Per Meter | Per Meter | Per Acre | $2,599 | $2,876 |
| Office | - | $265 | $76 | Per Meter | Per Meter | Per Acre | $1,639 | $1,980 |
| Industrial | - | $142 | $17 | Per Meter | Per Meter | Per Acre | $377 | $536 |
| Warehousing | - | $73 | $16 | Per Meter | Per Meter | Per Acre | $351 | $440 |
| Hospital | - | $234 | $61 | Per Meter | Per Meter | Per Acre | $1,305 | $1,600 |
| Nursing Home | - | $186 | $35 | Per Meter | Per Meter | Per Acre | $750 | $971 |
| **Nonresidential (per bed)** | | | | | | | | |
| Assisted Living | | $54 | $12 | Per Meter | Per Meter | Per Acre | $262 | $328 |
| **Nonresidential (per room)** | | | | | | | | |
| Motel | | $35 | $25 | Per Meter | Per Meter | Per Acre | $555 | $615 |

*Charged only for residential development

**Not including Storm Drainage for the residential categories and Storm Drainage, Water, and Sewer for the nonresidential categories

Please note that TischlerBise has calculated fire, police, and transportation fees for additional land use categories, including Warehousing, Hospital, Nursing Home, Assisted Living (by bed), and Motel (by room). Special fees for these categories were not included for water and sewer (which are calculated by meter) or storm drainage (calculated per acre and dependent on specific impervious surface area averages which are not available for these land uses). The storm drainage fee should be administrated by choosing the most appropriate fee from the broader Commercial, Office, and Industrial categories.

Specific comparisons to current fees are included in each fee chapter. Below are the highlights of changes from the last study and current fees:

- The proposed parks fee has increased due to the reinstatement of a land acquisition component for neighborhood parks and a planned component for the City's planned recreation center.
- The fire fee has decreased for residential land uses due to a change in methodology for station space from incremental expansion to cost recovery on Station 54, as well as the inclusion of fire suppression apparatus for nonresidential development only (in accordance with the Impact Fee Act).
- The police fee has also decreased for both residential categories and the Commercial and Industrial categories due to the use of functional population for allocating costs (as opposed to calls for service data, which was used in the previous study) and the increased debt service credit needed to prevent double payment for the Station 54 police substation.
- Most components in the water and sewer fees are now calculated with capacity added to the system (as opposed to total increase in expected demand). Collection improvements (for sewer) and transmission improvements (for water) continue to be calculated with total increase in expected demand. In addition, average demand for sewer is based on water demand but adjusted for total flows experienced at the South Valley Water Reclamation Facility. Both fees are set to increase slightly.

- Storm drainage fees increase for residential categories and decrease for nonresidential categories based on a new IFFP cost base, adjusted dwelling unit per acre and impervious surface percentage estimates (for residential), and floor-area-ratio and impervious surface percentage estimates (for nonresidential).
- Transportation fees decrease due to the need for fewer road projects within the IFFP horizon.

A note on rounding: Calculations throughout this report are based on an analysis conducted using Excel software. Results are discussed in the report using one-and two-digit places (in most cases), which represent rounded or truncated figures. However, in some instances the analysis itself uses figures carried to their ultimate decimal places (e.g., for level of service standards); therefore the sums and products generated in the analysis may not equal the sum or product if the reader replicates the calculation with the factors shown in the report (due to the rounding of figures shown).

# General Impact Fee Requirements

Development impact fees, also known as impact or development fees, are one-time payments used to fund capital improvements necessitated by new growth. Development impact fees have been utilized by local governments in various forms for at least fifty years. Impact fees do have limitations, and should not be regarded as the total solution for infrastructure financing needs. Rather, they should be considered one component of a comprehensive portfolio to ensure adequate provision of public facilities with the goal of maintaining current levels of service in a community. Any community considering development impact fees should note the following limitations:

- Development impact fees can only be used to finance capital infrastructure and cannot be used to finance ongoing operations and/or maintenance and rehabilitation costs;
- Development impact fees cannot be deposited in the local government's General Fund. The funds must be accounted for separately in individual accounts and earmarked for the capital expenses for which they were collected; and
- Development impact fees cannot be used to correct existing infrastructure deficiencies unless there is a funding plan in place to correct the deficiency for all current residents and businesses in the community.

## LEGAL FRAMEWORK

*U.S. Constitution*. Like all land use regulations, development exactions—including development impact fees—are subject to the Fifth Amendment prohibition on taking of private property for public use without just compensation. Both state and federal courts have recognized the imposition of impact fees on development as a legitimate form of land use regulation, provided the fees meet standards intended to protect against regulatory takings. To comply with the Fifth Amendment, development regulations must be shown to substantially advance a legitimate governmental interest. In the case of impact fees, that interest is in the protection of public health, safety, and welfare by ensuring that development is not detrimental to the quality of essential public services.

There is little federal case law specifically dealing with impact fees, although other rulings on other types of exactions (e.g., land dedication requirements) are relevant. In one of the most important exaction cases, the U. S. Supreme Court found that a government agency imposing exactions on development must demonstrate an "essential nexus" between the exaction and the interest being protected (see *Nollan v. California Coastal Commission,* 1987). In a more recent case (*Dolan v. City of Tigard, OR,* 1994), the Court ruled that an exaction also must be "roughly proportional" to the burden created by development. However, the *Dolan* decision appeared to set a higher standard of review for mandatory dedications of land than for monetary exactions such as development impact fees.

## REQUIRED FINDINGS

There are three reasonable relationship requirements for development impact fees that are closely related to "rational nexus" or "reasonable relationship" requirements enunciated by a number of state courts. Although the term "dual rational nexus" is often used to characterize the standard by which courts evaluate the validity of development impact fees under the U.S. Constitution, we prefer a more rigorous formulation that recognizes three elements: "impact or need," "benefit," and "proportionality." The dual rational nexus test explicitly addresses only the first two, although proportionality is reasonably implied, and was specifically mentioned by the U.S. Supreme Court in the *Dolan* case. The reasonable relationship language of the statute is considered less strict than the rational nexus standard used by many courts. Individual elements of the nexus standard are discussed further in the following paragraphs.

*Demonstrating an Impact*. All new development in a community creates additional demands on some, or all, public facilities provided by local government. If the supply of facilities is not increased to satisfy that additional demand, the quality or availability of public services for the entire community will deteriorate. Impact/development impact fees may be used to recover the cost of development-related facilities, but only to the extent that the need for facilities is a consequence of development that is subject to the fees. The *Nollan* decision reinforced the principle that development exactions may be used only to mitigate conditions created by the developments upon which they are imposed. That principle clearly applies to impact fees. In this study, the impact of development on improvement needs is analyzed in terms of quantifiable relationships between various types of development and the demand for specific facilities, based on applicable level-of-service standards.

*Demonstrating a Benefit*. A sufficient benefit relationship requires that fee revenues be segregated from other funds and expended only on the facilities for which the fees were charged. Fees must be expended in a timely manner and the facilities funded by the fees must serve the development paying the fees. Procedures for the earmarking and expenditure of fee revenues are typically mandated by the State enabling act, as are procedures to ensure that the fees are expended expeditiously or refunded. All of these requirements are intended to ensure that developments benefit from the fees they are required to pay. Thus, an adequate showing of benefit must address procedural as well as substantive issues.

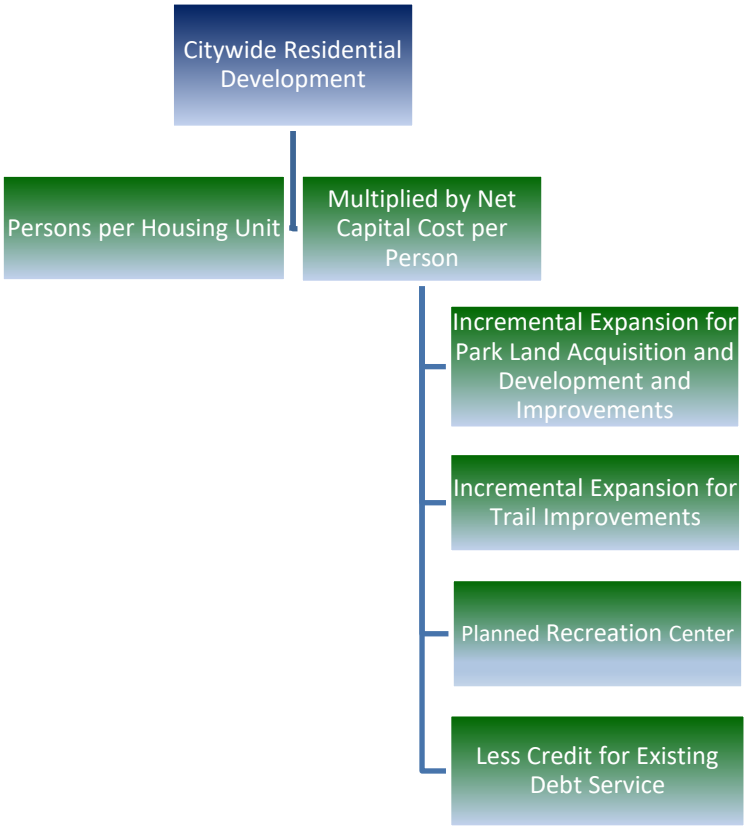
*Demonstrating Proportionality*. The requirement that exactions be proportional to the impacts of development was clearly stated by the U.S. Supreme Court in the *Dolan* case (although the relevance of that decision to impact fees has been debated) and is logically necessary to establish a proper nexus. Proportionality is established through the procedures used to identify development-related facility costs, and in the methods used to calculate impact fees for various types of facilities and categories of development. The demand for facilities is measured in terms of relevant and measurable attributes of development. For example, the need for school improvements is measured by the number of public school-age children generated by development.

# Parks

## METHODOLOGY

The parks impact fee is derived using a hybrid incremental expansion and planned-based methodology. The methodology for the parks impact fee is diagrammed in Figure 4. It is important to note that the parks impact fee methodology excludes mini-parks, which typically have a very small area of benefit. All cost components are allocated 100% to residential development.

**Figure 4. Parks Impact Fee Methodology**




## LEVEL OF SERVICE AND INFRASTRUCTURE STANDARDS FOR PARKS

### *Park Inventory and Park Classification*

Figure 5 details park classification and minimum service area. West Jordan categorizes parks into three types: Mini Parks, Neighborhood Parks, and Community Parks. Mini Parks are classified by the City as smaller than one acre with an attendance radius of 0.25 miles and maximum of 0.5 miles. Since these parks serve a limited service area, they are not included in the impact fee analysis.

### Figure 5. Size Classification and Park Service Area

| Classification | Minimum Size | Maximium Size | Minimum Serivce Area Radii |
|---|---|---|---|
| MiniParks | .5 Acres | 1 Acre | .25 Miles |
| Neighborhood Parks | 2.5 Acres | Less than or equal to 20 Acres | .5 Miles |
| Community Parks | Greater than 20 acres | Less than 200 Acres | 1 Mile |

### Community Park Land Level of Service

Figure 6 shows the current inventory of community park acres and LOS on which this component of the impact fee is based. As shown in Figure 6, West Jordan currently has 211.66 acres of community parks. This acreage does not include open space, which is characterized by limited improvements and passive uses. West Jordan plans to develop its existing inventory of community parks and has no plans to acquire additional community park land at this time. The current LOS for community park acreage is derived by dividing the total number of acres by the 2015 population estimate, resulting in a current LOS of 2.00 community park acres per 1,000 persons (211.66 acres of community parks / (106,021 residents in base year / 1,000) = 2.00 community park acres per 1,000 persons).

### Figure 6. Community Parks Level of Service

| Community Parks Site | Developed Acres |
|---|---|
| Ron Wood Memorial Park | 24.46 |
| Utah Youth Sports Complex | 97.30 |
| Veterans Memorial Park | 89.90 |
| **Total:** | **211.66** |

| Level of Service (LOS) Standards | |
|---|---|
| Inventory of Community Park Acres | 211.66 |
| 2015 West Jordan Population | 106,021 |
| **LOS: Acres per 1,000 Persons** | **2.00** |

*Source: City of West Jordan*

### Neighborhood Parks Level of Service

As shown in Figure 7, West Jordan currently has 111.49 acres of neighborhood park land. This acreage does not include open space, which is characterized by limited improvements and passive uses. The existing level of service, calculating in the same fashion as with community parks, is 1.05 acres per 1,000 persons (rounded). The estimated land acquisition cost for a neighborhood park is $141.96 per person ((1.05 acres per 1,000 persons / 1,000 persons) X $135,000 land acquisition cost per acre).

## Figure 7. Neighborhood Parks Level of Service

| Neighborhood Parks Site | Developed Acres |
|---|---|
| Bicentennial Park | 1.55 |
| Brigadoon Park | 2.34 |
| Browns Meadow Park | 5.89 |
| Camelot Park | 2.24 |
| Colonial Estates Park | 2.81 |
| Constitution Park | 13.65 |
| Dixie Valley Park | 3.82 |
| Dorilee Park | 2.94 |
| Hand Cart Park | 1.30 |
| Harvest Estates Park | 2.95 |
| Jordan Meadows Park | 4.09 |
| Lindsay Estates Park (Paul D. Henderson Memorial Park) | 1.68 |
| Maples Park | 2.00 |
| McHeather Park | 1.60 |
| Meadow Greens Farm Park | 1.57 |
| Oaks Park East | 3.06 |
| Oaks Park | 4.37 |
| Park Village Park | 4.85 |
| Plum Creek Park/Urban Fishery | 3.66 |
| Rail Road Park | 6.53 |
| Ranches Park Common | 1.49 |
| Senior Housing Park | 2.53 |
| Shadow Mountain South Park | 7.20 |
| Stone Creek Park 1 | 2.60 |
| Stone Creek Park 2 | 1.85 |
| Sunset Park | 2.13 |
| Sycamore Ridge Park | 1.43 |
| Teton Estates Park | 11.28 |
| Vista West Park | 2.33 |
| Wildflower Park | 5.75 |
| **Total:** | **111.49** |

| Level of Service (LOS) Standards | |
|---|---|
| Inventory of Developed Park Acres | 111.49 |
| 2015 West Jordan Population | 106,021 |
| **LOS: Acres per 1,000 Persons** | **1.05** |

| Cost Analysis | |
|---|---|
| Acres per 1,000 Persons | 1.05 |
| Land Cost Per Acre* | $135,000 |
| **Land Cost per Person** | **$141.96** |

*Cost per acre provided by the City of West Jordan.

Source: City of West Jordan, Utah

## Park Development and Improvement Level of Service and Cost Analysis

Figure 8 summarizes the types of land development items and related costs for a 3.1 acre park. The City of West Jordan provided the land development cost for a typical park in 2011. This number was adjusted to 2015 costs using Engineering News-Record's Construction Index. The average land development cost is $112,800 per acre ($349,561 total development cost / 3.1 acres = $112,800 cost per acre (rounded)).

The estimated land development cost for a community park is $225.60 per person ((2.00 acres per 1,000 persons / 1,000 persons) X $112,800 development cost per acre = $225.60 per person). The estimated land development cost for a neighborhood park is $118.62 per person ((1.05 acres per 1,000 persons / 1,000 persons) X $112,800 development cost per acre = $118.62 per person).

**Figure 8. Park Development Level of Service and Cost Analysis**

| *Item* | *Cost for a 3.1 Acre Site** |
|---|---|
| Survey/Engineering | $37,219 |
| Clearing/grubbing/grading | $24,200 |
| Top soil | $28,000 |
| Utilities & street improvements | $112,169 |
| Hydroseeding | $17,000 |
| Irrigation | $47,000 |
| Trees | $38,000 |
| Sidewalks | $13,442 |
| ***Total*** | ***$317,029*** |
| ***Cost Adjusted Total*** | ***$349,561*** |

**Costs provided by the City of West Jordan in 2011 and adjusted to current costs using Engineering News-Record's Construction Index*

| ***Community Parks Level of Service (LOS) Standards*** | |
|---|---|
| Average per Acre (rounded) | $112,800 |
| LOS: Acres per 1,000 Persons | 2.00 |
| ***Land Development Cost per Person*** | ***$225.60*** |

| ***Neighborhood Parks Level of Service (LOS) Standards*** | |
|---|---|
| Average per Acre (rounded) | $112,800 |
| LOS: Acres per 1,000 persons | 1.05 |
| ***Land Development Cost per Person*** | ***$118.62*** |

Source: City of West Jordan, Utah

Figure 9 lists the current LOS and cost factors for park improvements at community and neighborhood parks. The total value of park improvements is based on the inventory of improvements provided by City staff. There are 181 park improvements in West Jordan parks, resulting in a current LOS of 1.71 improvements per 1,000 persons. The average cost per improvement is $74,100 ($13,413,000 total cost of improvements / 181 units). To determine the cost per demand unit for recreation improvements, the LOS standard of 1.71 improvements per 1,000 persons is divided by 1,000 persons and multiplied by the average cost per improvement ($74,100), yielding a citywide park improvements cost per person of $126.71.

### Figure 9. Level of Service and Cost Factors for Park Improvements

| Improvement Type | Total Units | Unit Cost | Total |
|---|---|---|---|
| Pavillion | 43 | $37,000 | $1,591,000 |
| Bathroom | 9 | $200,000 | $1,800,000 |
| Water Fountain and Hookup | 23 | $4,000 | $92,000 |
| Playground [1] | 45 | $62,000 | $2,790,000 |
| Basketball Court | 11 | $50,000 | $550,000 |
| Tennis Court | 9 | $60,000 | $540,000 |
| Softball Field | 8 | $200,000 | $1,600,000 |
| Baseball Field | 12 | $200,000 | $2,400,000 |
| Soccer Field [2] | 20 | $70,000 | $1,400,000 |
| Splashpad | 1 | $650,000 | $650,000 |
| *Total* | *181* | *$1,533,000* | *$13,413,000* |

*[1] Used large playground cost as median cost between small and community-wide park playgrounds*
*[2] Derived from cost of soccer fields in nearby communities*

***Level of Service (LOS) Standards***

| | |
|---|---|
| Number of Improvements | 181 |
| 2015 West Jordan Population | 106,021 |
| ***Current LOS: Improvements per 1,000 Persons*** | ***1.71*** |

***Cost Analysis***

| | |
|---|---|
| Total Value of Park Improvements | $13,413,000 |
| Average Cost per Improvement | $74,100 |
| ***Citywide Park Improvements Cost per Person*** | ***$126.71*** |

Source: City of West Jordan, Utah

### *Trails Level of Service and Cost Analysis*

Figure 10 provides West Jordan's current inventory of trails. The City has 63,782.40 feet (or 12.80 miles) of trails, providing a LOS of 0.60 linear feet per person (63,782.40 total linear feet / 106,021 persons = 0.60). This does not include sidewalk connections, which the City no longer considers part of the trail system. According to City staff, the cost for trails is approximately $82 per linear foot. To determine the cost per demand unit for trails, the cost per linear foot is multiplied by the linear feet per person LOS standard of 0.60, yielding a trails cost per person of $49.20.

## Figure 10. Level of Service and Cost Factors for Trail Development

| Trail Name | Location | Miles | Linear Feet |
|---|---|---|---|
| Jordan River Trail | 7700 s - Winchester | 1.91 | 10,084.80 |
| Jordan River Trail | 8350 s - 9000 s | 1.08 | 5,702.40 |
| Jordan River Trail (Lucky Clover Cont.) | 7200 s 1050 w | 0.22 | 1,161.60 |
| Jordan River Trail (8600 s Connector) | 8600 s 1075 w | 0.10 | 528.00 |
| Mountain View Corridor Trail | MVC 9000 s - 9400 s | 1.50 | 7,920.00 |
| Mountain View Corridor Trail | MVC 9000 s - 7800 s | 1.62 | 8,553.60 |
| Mountain View Corridor Trail | MVC 7800 s - 7000 s | 1.17 | 6,177.60 |
| Barney's Wash Trail | 8950 s 6400 w - Duck Ridge | 0.33 | 1,742.40 |
| Barney's Creek Trail | 8600 s 6260 w - 6130 w | 0.27 | 1,425.60 |
| Barney's Creek Trail | 8350 s 6000 w 5900 w | 0.18 | 950.40 |
| No Name (High School Wash) | 8085 s 6400w - 6500 w | 0.18 | 950.40 |
| Sycamores Trail | New Sycamores Dr | 0.39 | 2,059.20 |
| Clay Hollow Wash Trail | 7800 s U-111 - 6700 w | 0.27 | 1,425.60 |
| Clay Hollow Wash Trail | 7800 s 6700 w - 6450 w | 0.29 | 1,531.20 |
| Clay Hollow Wash Trail (connector) | 7800 s 6540 w | 0.01 | 52.80 |
| Clay Hollow Wash Trail (connector) | 7800 s 6500 w | 0.07 | 369.60 |
| Senior Housing Trail | Sugar Factory Rd 2200 w | 0.31 | 1,636.80 |
| Barney's Creek Trail (north) | 7900 s 4800 w - 5000 w | 0.26 | 1,372.80 |
| Barney's Creek Trail (south) | 7900 s 4800 w - 5600 w | 1.10 | 5,808.00 |
| Barney's Creek Trail (Connector west) | Mack's Inn Circle | 0.01 | 52.80 |
| Barney's Creek Trail (Connector Tunnel) | Grizzly Way 8100 s | 0.07 | 369.60 |
| Barney's Creek Trail (Connector School) | Amethyst Dr 5140 w | 0.07 | 369.60 |
| Barney's Creek Trail (Connector Park) | Amethyst Dr 4880 w | 0.02 | 105.60 |
| Barney's Creek Trail | Window Ranch Wy 5600 w | 0.18 | 950.40 |
| U-111 Frontage Trail | U-111 7800 s - 8200 s | 0.47 | 2,481.60 |
| | ***Total*** | **12.08** | **63,782.40** |

| Trail Costs | |
|---|---|
| Cost for trails per mile | $432,000 |
| Feet in mile | 5,280 |
| ***Cost per Foot:*** | ***$82*** |

| Level of Service (LOS) Standards | |
|---|---|
| Total Linear Feet | 63,782 |
| 2015 West Jordan Population | 106,021 |
| ***LOS: Linear Feet per Person*** | ***0.60*** |

| Cost Analysis | |
|---|---|
| LOS: Linear Feet per Person | 0.60 |
| Cost per Linear Foot [1] | $82 |
| ***Trails Cost per Person*** | ***$49.20*** |

*1. Cost per linear foot provided by City of West Jordan.*

Source: City of West Jordan

## PROJECTED NEED FOR PARK FACILITIES

The need for additional park infrastructure, based on projected population growth over the next six years and LOS standards as discussed above, is shown in Figure 11. LOS standards, park and trail development, land purchase, and recreation improvement costs are shown in Figure 11. Need is projected by multiplying expected population by level of service standard. Cost is calculated by determining six year increases and multiplying by the cost factors. For instance, population growth over six years necessitates the acquisition of 12.02 additional neighborhood park acres (123.34 acres in 2021 – 111.32 acres in 2015). Each acre costs $135,000 to acquire on average, yielding a total cost of $1,622,700).

Over the next six years, it is projected that West Jordan will spend approximately $2.6 million to develop community parks, $3 million to acquire land for and develop new neighborhood parks, and $1.5 million for recreation improvements. Additionally, it is projected that the City will provide 6,869 linear feet of trails costing an estimated $560,000.

### Figure 11. Projected Growth Needs

***Park Level of Service (LOS) Standards***

| | | |
|---|---|---|
| Community Parks LOS | 2.00 | acres per 1,000 persons |
| Neighborhood Park LOS | 1.05 | acres per 1,000 persons |
| Land Acquisition Cost | $135,000 | per acre |
| Park Development Cost | $112,800 | per acre |
| Recreation Improvements LOS | 1.71 | per 1,000 persons |
| Recreation Improvements Cost | $74,100 | per improvement |
| Trails Level of Service | 0.60 | linear feet per person |
| Trails Cost | $82 | per linear foot |

| | | | Infrastructure Needed | | | |
|---|---|---|---|---|---|---|
| | | *West Jordan Population* | *Community Park Development* | *Neighborhood Park Acquisition and Development* | *Recreation Improvements* | *Linear Feet of Trails* |
| | *Year* | | | | | |
| Base | 2015 | 106,021 | 212.04 | 111.32 | 181.30 | 63,613 |
| 1 | 2016 | 107,878 | 215.76 | 113.27 | 184.47 | 64,727 |
| 2 | 2017 | 109,734 | 219.47 | 115.22 | 187.65 | 65,841 |
| 3 | 2018 | 111,591 | 223.18 | 117.17 | 190.82 | 66,955 |
| 4 | 2019 | 113,447 | 226.89 | 119.12 | 194.00 | 68,068 |
| 5 | 2020 | 115,304 | 230.61 | 121.07 | 197.17 | 69,182 |
| 6 | 2021 | 117,470 | 234.94 | 123.34 | 200.87 | 70,482 |
| *Six-Yr Increase* | | 11,449 | 22.90 | 12.02 | 19.57 | 6,869 |

| | |
|---|---|
| Cost of Community Park Development | $2,583,120 |
| Cost of Neighborhood Park Land Acquisition | $1,622,700 |
| Cost of Neighborhood Park Development | $1,355,856 |
| Cost of Recreation Improvements | $1,450,137 |
| Cost of Trail Improvements | $563,258 |
| | **$7,575,071** |

## DEBT SERVICE CREDIT EVALUATION

In 2004, West Jordan issued a bond for construction of the Justice Center and Parks/Open Space improvements. The share of the bond that went towards park-related improvements is 38.1 percent of the total issue. To avoid potential double payment for park improvements, a credit is necessary because new residential units that will pay the impact fee will also contribute to future principal payments on this remaining debt.

As shown in Figure 12, the share of outstanding debt attributable to parks is $2,878,733. To derive the credit amount, annual principal payments are divided by the total population. For example, in fiscal year 2022, the principal to be paid of approximately $288,249 is divided by the projected population of 119,636 for a payment of $2.41 per person.

To account for the time value of money, annual payments per person are discounted using a net present value formula based on an average current interest rate of 2.28 percent. The total net present value of future principal payments per person is $22.35 per person. This amount is subtracted from the gross capital cost per person amount to derive a net capital cost per person for park facilities.

**Figure 12. Parks Principal Payment Credit Evaluation**

| Year | Principal Payments [1] | Projected Population | Principal Payment Credit Per Person |
|---|---|---|---|
| FY 15-16 | $287,100 | 106,021 | $2.71 |
| FY 16-17 | $286,571 | 107,878 | $2.66 |
| FY 17-18 | $287,643 | 109,734 | $2.62 |
| FY 18-19 | $288,187 | 111,591 | $2.58 |
| FY 19-20 | $288,311 | 113,447 | $2.54 |
| FY 20-21 | $289,658 | 115,304 | $2.51 |
| FY 21-22 | $288,363 | 117,470 | $2.45 |
| FY 22-23 | $288,249 | 119,636 | $2.41 |
| FY 23-24 | $287,344 | 121,802 | $2.36 |
| FY 24-25 | $287,308 | 123,968 | $2.32 |
| Total | $2,878,733 | | $25.16 |
| | | *Discount Rate* | *2.28%* |
| | | **Present Value** | **$22.35** |

*1. 38.1% of 2004 General Obligation Bond is for Open Space/Parks. 2004 bond was refinanced in 2014.*

## PLANNED RECREATION CENTER

Discussions with staff indicate that the City of West Jordan will construct a recreation center; it currently does not have any indoor recreation space. The center will be the City's first and serve its entire population. Initial plans indicate the cost of construction will total $47 million. Groundbreaking is planned for 2017.

This facility will be designed and constructed to accommodate the recreation needs of both the City's current and future populations for at least the next 20 years. To determine new growth's share of this facility, TischlerBise calculated future population growth from 2017 to 2037 as a share of total population in 2037 (1 – (2017 Population / 2037 Population)). Future population growth will account for 28 percent of the population in 2037 (1 – (109,734 population in 2016 / 152,125 population in 2037) = 28%). These projections indicate an increase in population of 42,391 people during this time period.

This growth share is then multiplied by the cost of the facility. Therefore, the 28 percent share is multiplied by $47 million cost, resulting in a growth share cost of $13,096,840.34, which is divided by the projected population increase of 42,391 to yield a cost per person of $308.96.

This calculation is shown in Figure 13. Please note that because the City will not pay the growth share of future debt service with other revenue, a credit for future debt service payments is not applicable.

### Figure 13: Planned Recreation Center

| Recreation Center | |
|---|---|
| Total Cost [1] | $47,000,000 |
| Growth Share (2017-2037) [2] | 28% |
| Growth Share Cost | $13,096,849.34 |
| Population Increase | 42,391 |
| ***Cost per Person*** | **$308.96** |

*[1] City staff estimate*

*[2] 1-(Population in 2017 / Population in 2037)*

## PROPOSED IMPACT FEES FOR PARKS

Infrastructure standards used in the park impact fee calculations are listed at the top of Figure 14. The net capital cost for parks is $1,142.09 for each resident added to West Jordan. Impact fees per unit are derived by multiplying persons per housing unit by the total infrastructure cost per person. Therefore, the impact fee for a multifamily unit is $2,318 (2.03 persons per housing unit X $1,142.09 infrastructure cost per person = $2,318 (truncated)). The single family fee is $4,054 and calculated in the same fashion.

### Figure 14. Proposed Park Impact Fees

| ***Infrastructure Costs per Person*** | |
|---|---|
| **Community Parks** | |
| *Land Development* | $225.60 |
| **Neighborhood Parks** | |
| *Land Acquisition* | $141.96 |
| *Land Development* | $118.62 |
| **Recreation Improvements** | $126.71 |
| **Trails** | $49.20 |
| **Recreation Center** | $308.96 |
| **Debt Service Credit** | ($22.35) |
| ***Total Net Cost per Person*** | **$948.70** |

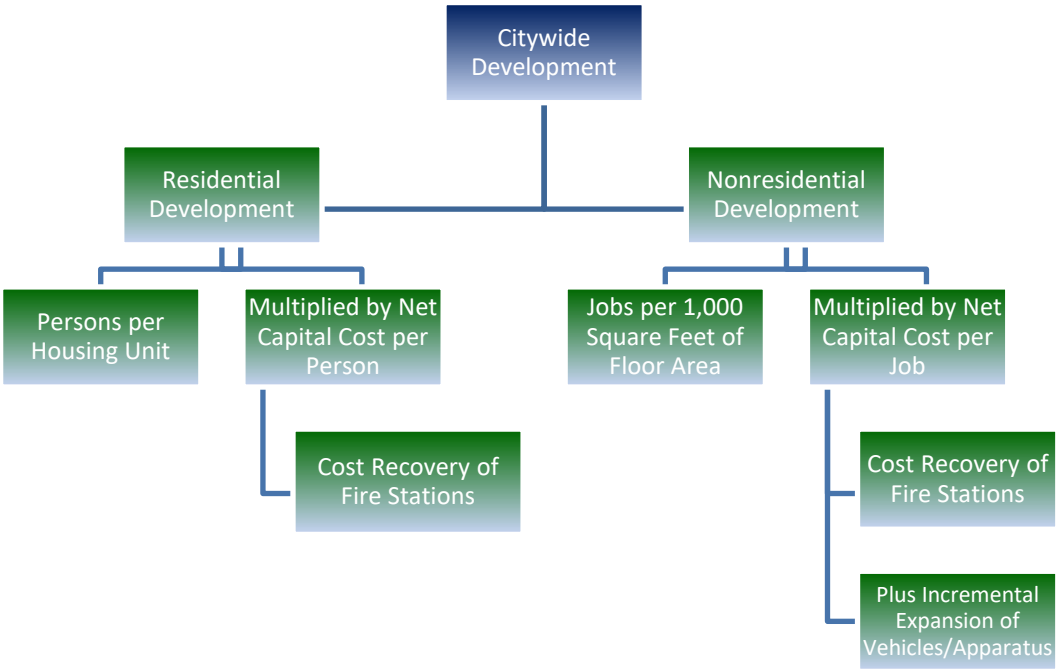
| *Unit Type* | *Persons per Housing Unit* | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|
| Single Family | 3.55 | **$3,367** | $2,070 | $1,297 |
| Multifamily | 2.03 | **$1,925** | $1,374 | $551 |

# Fire

## METHODOLOGY

The fire impact fee for West Jordan utilizes a combination of the incremental expansion and cost recovery approaches, with infrastructure costs allocated to both residential and nonresidential development based on an analysis of calls for service data for fire services. The formula for the fire impact fee is diagrammed in Figure 15. For residential development, fire impact fees are a function of population growth. Fire impact fees for nonresidential development are based on the estimated number of employees per 1,000 square feet of floor area.

**Figure 15. Fire Impact Fee Methodology**




## PROPORTIONATE SHARE ANALYSIS

The demand for fire building space and vehicles is a function of both residential and nonresidential development. TischlerBise obtained calls for service data for fire and emergency medical services for 2014 to determine the proportionate share of the fire infrastructure demand from residential and nonresidential development. Calls with no associated land uses, such as road-related services, were not allocated to residential or nonresidential development and are not included in the fee calculation.

Figure 16 indicates that 66.2 percent of calls were to residential units and 33.8 percent were to nonresidential uses. To ensure the impact fees are proportionate to demand, levels of service for fire facilities are derived using these proportionate share factors.

**Figure 16. Fire Calls for Service for 2014**

| Land Use Type | Fire Calls | Medical Calls | Total | Proportionate Share |
|---|---|---|---|---|
| Residential | 1,402 | 2,486 | 3,888 | 66.2% |
| Nonresidential | 634 | 1,347 | 1,981 | 33.8% |
| **Total** | **2,036** | **3,833** | **5,869** | **100%** |

*Source: 2014 calls for service by land use type provided by City of West Jordan*

## FIRE STATION 54 COST RECOVERY

In 2013, West Jordan issued a Sales and Use Tax bond to finance its new fire station, Station 54. This portion of the fire impact fee will be used to cover new development's share of the Station 54 debt service payments. Because the City will not pay the growth share of debt service with sales tax revenue, a revenue credit for future sales and use taxes is not applicable.

Station 54 is an expanded station that replaced the City's existing fourth fire station, which had been built by volunteers in 1980 and no longer met code. The new 14,619 square foot station also has a police substation of approximately 5,840 square feet (40% of total square footage). Because the old Station 54 was no longer useable, it is not considered a component of the City's LOS for fire infrastructure. Therefore, its square footage is not credited against the new fire square footage, and the cost of constructing all 9,770 square feet (14,619 total square feet – 4,849 police square feet) of Station 54 devoted to fire services (60%) is eligible for consideration in the cost recovery calculation. Future debt service for Station 54, as shown in Figure 17, totals $1,785,790.

**Figure 17. Station 54 Remaining Debt Service**

***Sales Tax Revenue Bonds, Series 2013***

| *Year* | *Principal Payments* |
|---|---|
| FY 16-17 | $222,646 |
| FY 17-18 | $221,420 |
| FY 18-19 | $223,093 |
| FY 19-20 | $221,661 |
| FY 20-21 | $223,128 |
| FY 21-22 | $224,457 |
| FY 22-23 | $225,649 |
| FY 23-24 | $223,736 |
| Total | $1,785,790 |

As shown in Figure 18, a 14.7 percent growth share adjusts total debt service to the amount attributable to new development. The growth share is based on the increase in population and jobs from 2015 to 2024, which is the year of the final debt payment (1 – (106,021 population + 26,236 jobs) / (123,968 population + 31,142 jobs)). To derive the cost per demand unit, the growth cost of Station 54 debt service is allocated to the increase in residential and nonresidential demand units. For residential development, the cost of $9.71 per person assumes a 66.2% cost allocation (from the proportionate share analysis in Figure 16) and a projected population increase of 17,946 persons from 2015 to 2024 ($263,105 x 66.2% / 17,946). For nonresidential development, the truncated cost of $18.10 per job assumes a cost allocation of 33.8% (from Figure 16) and a projected increase of 4,906 jobs from 2015 to 2024 ($263,105 x 33.8% / 4,906).

**Figure 18. Station 54 Cost Allocation**

| Name of Debt Obligation | Growth Share* | FY of Final Payment | Growth Cost | Population Increase 2015-2024 | Job Increase 2015-2024 |
|---|---|---|---|---|---|
| Series 2013 | 14.7% | 2023-24 | $263,105 | 17,946 | 4,906 |

** Growth Share formula is 1-(Population and Jobs in 2015/Population and Jobs in 2025)*

| Cost Allocation | | |
|---|---|---|
| Residential (per person) | 66.2% | **$9.71** |
| Nonresidential (per job) | 33.8% | **$18.10** |

## FIRE VEHICLES AND APPARATUS LEVEL OF SERVICE STANDARDS AND COST FACTORS

Pursuant to the revised Section 11-36a-102(17) of the Utah Code, only fire suppression vehicles costing in excess of $500,000 are now considered public safety facilities eligible for impact fee revenue use. West Jordan currently has seven vehicles which fit this criterion. Figure 19 displays the type of vehicle, unit (replacement) cost, and the number in the fleet. Using these costs, TischlerBise calculated an approximate average cost per apparatus of $686,000.

Additionally, Section 11-36a-202(2) of the Utah Code now prohibits the imposition on residential development of impact fees for fire suppression vehicles. Therefore, this component of the fee is only charged for nonresidential development. In order to ensure nonresidential development only pays its fair share of the cost of apparatus fleet expansion, the nonresidential LOS standard is determined by multiplying the current pieces of apparatus (7) by the proportionate share of nonresidential calls for service and dividing by jobs in 2015. For example: 7 pieces of apparatus x 33.8% proportionate share of nonresidential / 26,236 current jobs in 2015 = 0.00009 apparatus per job. TischlerBise then determined the capital cost per job by multiplying the LOS standard of 0.00009 pieces of fire apparatus per job by the average cost per unit of apparatus ($686,000), yielding a capital cost for apparatus of $61.78 per job.

### Figure 19. Fire Vehicles and Apparatus Level of Service

| Fire Apparatus | Items | Unit Cost | Total Cost |
|---|---|---|---|
| Heavy Rescue Truck | 1 | $600,000 | $600,000 |
| Engine | 5 | $640,000 | $3,200,000 |
| Aerial Ladder | 1 | $1,000,000 | $1,000,000 |
| | 7 | | $4,800,000 |

***Allocation Factors for Fire Apparatus***

| | |
|---|---|
| Average Cost per Unit | $686,000 |
| Nonresidential Share | 33.8% |
| Jobs in 2015 | 26,236 |

***Level-of-Service Standards for Fire Apparatus***

| | Fire Apparatus | Capital Cost |
|---|---|---|
| Nonresidential (per job) | 0.00009 | $61.78 |

Source: City of West Jordan, Utah

## PROJECTED NEED FOR FIRE VEHICLES AND APPARATUS

Figure 20 depicts projected demand for fire station vehicles and apparatus over the next six years. Demand from nonresidential growth will require the addition of 0.29 vehicles/apparatus for a total cost of approximately $202,000 over the next six years (0.29 vehicles/apparatus X $686,000 average cost per vehicle/apparatus).

### Figure 20. Fire Station Needs Analysis

| | | |
|---|---|---|
| Vehicle/Apparatus LOS - Nonres. | 0.00009 | vehicles/apparatus per job |
| Vehicle/Apparatus Cost | $686,000 | per vehicle/apparatus |

| | Year | Jobs | Infrastructure Needed: Vehicles/Apparatus Nonresidential |
|---|---|---|---|
| Base | 2015 | 26,236 | 2.36 |
| Year 1 | 2016 | 26,781 | 2.41 |
| Year 2 | 2017 | 27,326 | 2.46 |
| Year 3 | 2018 | 27,871 | 2.51 |
| Year 4 | 2019 | 28,416 | 2.56 |
| Year 5 | 2020 | 28,962 | 2.61 |
| Year 6 | 2021 | 29,507 | 2.66 |
| | *Six-Year Increase =>* | 3,271 | 0.29 |
| Total Growth-Related Cost of Vehicles/Apparatus => | | | **$202,074** |

## FIRE IMPACT FEE CALCULATIONS

Proposed fire impact fees are shown in Figure 21. For residential development, fire impact fees are based on persons per housing unit. For example, a single family unit will have an impact fee of $34 (3.55 persons

per housing unit X $9.71 net cost per person = $34 (truncated)). The multifamily fee is calculated in the same fashion and equals $20.

For nonresidential development, the fees are expressed per thousand square feet of floor area. Therefore, an office building with 30,000 square feet of floor area would pay a fire impact fee of $7,950 (i.e., 30 X $265). The $265 fee per thousand feet is calculated using the $79.88 net cost per job (3.32 jobs per KSF X $79.88 per job = $265 per KSF (truncated)). Industrial and commercial KSF fees are calculated using the same net cost per demand unit.

### Figure 21. Proposed Fire Impact Fees

***Residential***

| | Per Person |
|---|---|
| *Level of Service* | |
| Cost Recovery for Fire Stations (per Person) | $9.71 |
| Net Cost Per Demand Unit | $9.71 |

| *Unit Type* | *Persons per Housing Unit* | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|
| Single Family | 3.55 | **$34** | $138 | ($104) |
| Multifamily | 2.03 | **$20** | $92 | ($72) |

***Nonresidential Impact Fees***

| | Per Job |
|---|---|
| *Level of Service* | |
| Cost Recovery for Fire Stations (per Job) | $18.10 |
| Vehicle/Apparatus Cost (per Job) | $61.78 |
| Net Cost Per Demand Unit | $79.88 |

***Per 1,000 Square Feet of Floor Area***

| *ITE Code* | *Development Type* | *Jobs per KSF* | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|---|
| 820 | Commercial | 2.00 | **$159** | $122 | $37 |
| 710 | Office | 3.32 | **$265** | $203 | $62 |
| 140 | Industrial | 1.79 | **$142** | $179 | ($37) |
| 150 | Warehousing | 0.92 | **$73** | - | - |
| 610 | Hospital | 2.94 | **$234** | - | - |
| 620 | Nursing Home | 2.33 | **$186** | - | - |

***Per Bed***

| *ITE Code* | *Development Type* | *Jobs per Bed* | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|---|
| 254 | Assisted Living | 0.68 | **$54** | - | - |

***Per Room***

| *ITE Code* | *Development Type* | *Jobs per Room* | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|---|
| 320 | Motel | 0.44 | **$35** | - | - |

# Police

## METHODOLOGY

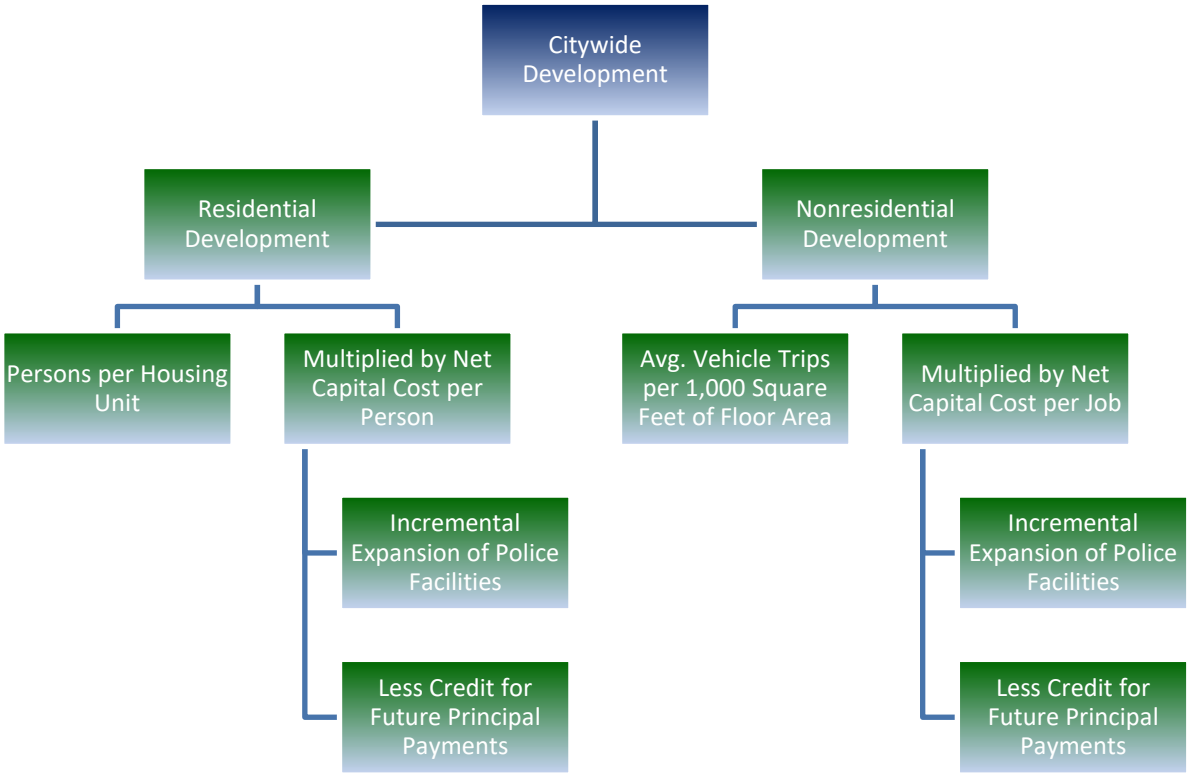
The police impact fee for West Jordan utilizes an incremental expansion methodology, with infrastructure costs allocated to both residential and nonresidential development based on a proportionate share analysis of functional population. The methodology for the police impact fee is diagrammed in Figure 22. For residential development, police impact fees are a function of population growth.

For nonresidential impact fees, TischlerBise recommends using nonresidential vehicle trips as the best demand indicator for police facilities and equipment. Trip generation rates are used for nonresidential development because vehicle trips are highest for commercial developments, such as shopping centers, and lowest for industrial/warehouse development. Office and institutional trip rates fall between the other two categories. This ranking of trip rates is consistent with the relative demand for public safety from nonresidential development. Other possible nonresidential demand indicators, such as employment or floor area, will not accurately reflect the demand for service. For example, if employees per thousand square feet were used as the demand indicator, police impact fees would be too high for office and institutional development because offices typically have more employees per 1,000 square feet than retail uses. If floor area were used as the demand indicator, police impact fees would be too high for industrial development.

Average weekday vehicle trip ends are from the reference book, *Trip Generation (Ninth Edition, 2012)*, published by the Institute of Transportation Engineers (ITE). A vehicle trip end represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). To calculate impact fees, trip generation rates are adjusted to avoid double counting each trip at both the origin and destination points—thereby allocating the trip to the appropriate land use.

The basic trip adjustment factor is 50 percent for all nonresidential development except commercial. For commercial/shopping center development, the trip adjustment factor is less than 50 percent because retail uses attract vehicles as they pass by on arterial and collector roads. For example, when someone stops at a convenience store on the way home from work, the convenience store is not the primary destination. Therefore, for an average size shopping center, the ITE manual indicates a trip adjustment factor of 34%.

**Figure 22. Police Impact Fee Methodology**




## PROPORTIONATE SHARE ANALYSIS

The Police impact fee uses functional population to determine the proportionate cost share for residential and nonresidential development. For residential development, the proportionate share factor is based on estimated person hours of non-working residents, plus the non-working hours of resident workers. Based on 2013 U.S. Census Bureau data, approximately 48% of West Jordan's population worked in 2013. For resident workers, two-thirds of a day (i.e., annualized average of 16 hours per day) was allocated to residential demand. Time spent at work (i.e., annualized average of 8 hours per day) was allocated to nonresidential development. In 2013, the U.S. Census Bureau's OnTheMap web application indicated that 5,530 City residents also worked in West Jordan, but 89% of workers commuted to out-of-town jobs. Total jobs located in West Jordan include 26,362 inflow commuters. Based on estimated person hours, the cost allocation for residential development is 90% while nonresidential development accounts for 10% of the demand for infrastructure.

### Figure 23 City of West Jordan Functional Population

| | | | | Demand Hours/Day | Person Hours | Proportionate Share |
|---|---|---|---|---|---|---|
| ***Residential*** | | | *Demand Units in 2013* | | | |
| | | Estimated Residents | 110,184 | | | |
| | 52% | Residents Not Working | 57,833 | 24 | 1,387,992 | |
| | 48% | Workers Living in City | 52,351 | | | |
| | 11% | City Residents Working in City | 5,530 | 16 | 88,480 | |
| | 89% | City Residents Working outside of City | 46,821 | 16 | 749,136 | |
| | | | | *Residential Subtotal* | 2,225,608 | **90%** |
| ***Nonresidential*** | | | | | | |
| | | Jobs Located in City | 30,892 | | | |
| | | City Residents Working in City | 5,530 | 8 | 44,240 | |
| | | Non-Resident Workers | 25,362 | 8 | 202,896 | |
| | | | | *Nonresidential Subtotal* | 247,136 | **10%** |
| | | | | TOTAL | 2,472,744 | **100%** |

*Source: US Census, OnTheMap Application and LEHD Origin-Destination Employment Statistics*

## POLICE LEVELS OF SERVICE STANDARDS AND COST FACTORS

The West Jordan Justice Center is the main law enforcement facility in the City. Additional administrative offices handle responsibilities not associated with law enforcement services, and, therefore, will not be included in the law enforcement fee calculation. The Police Department also staffs space in a substation at Station 54, as described above in the Fire section. However, the Department projects need for additional storage and office space in the near future.

The total square footage of the West Jordan Justice Center is 48,000 square feet. Of this, 42,196 square feet (88 percent) are used for police functions. As mentioned above, the additional square footage is allocated for functions not related to police services, such as Justice Courts, and is not included in the police impact fee calculation. Of the 14,619 square feet a Station 54, 8,779 square feet (40%) is devoted to the police substation.

Figure 24 indicates current employment base, residential/nonresidential proportionate share factors, current LOS standards, and cost per demand unit. The current residential LOS is derived by multiplying the total square footage of the West Jordan Justice Center and Station 54 (used for law enforcement functions) by the residential proportionate share and dividing by the 2015 population (48,037 sq. ft. X 90% proportionate share / 106,021 persons) resulting in a 0.41 sq. ft. per person. Similarly, nonresidential LOS is derived by multiplying total square footage by the proportionate share and dividing by total nonresidential vehicle trips (48,037 sq. ft. X 10% proportionate share / 83,307 vehicle trips) resulting in 0.06 sq. ft. per nonresidential vehicle trip.

TischlerBise determined a capital cost per person of $93.79 and per nonresidential vehicle trip of $13.25. For instance, for the nonresidential fee, 0.06 square feet per vehicle trip is multiplied by the cost per square foot of a new station ($230), yielding a cost per nonresidential vehicle trip of $13.25. Residential capital costs per person are calculated in the same fashion.

**Figure 24. Current Level of Service and Cost Factors for Police Facilities**

| Site | Current Sq. Ft. | Police Square Footage |
|---|---|---|
| West Jordan Justice Center | 48,000 | 42,196 |
| Station 54 Substation | 14,619 | 5,841 |
| | Total Sq. Ft. | 48,037 |

Cost per Sq. Ft. for New Station[1] ==> $230

| Land Use Type | Proportionate Share | 2015 Demand Units | Sq. Ft. per Demand Unit | Cost per Demand Unit |
|---|---|---|---|---|
| Residential | 90% | 106,021 Population | 0.41 | $93.79 |
| Nonresidential | 10% | 83,307 Vehicle Trips | 0.06 | $13.25 |

Source: City of West Jordan, Utah

## PROJECTED NEED FOR POLICE STATION SPACE

Figure 25 depicts projected demand for law enforcement space over the next six years. Demand from population and nonresidential growth will require 5,268 square feet of new law enforcement space for a total cost of $1,211,640 over the next six years. Residential growth demand will require 4,669 square feet of new space while nonresidential demand will require 599 square feet over the next six years.

**Figure 25. Police Facility Need Analysis**

| | |
|---|---|
| Police Building Space - Residential | 0.41 SF per Person |
| Police Building Space - Nonresidential | 0.06 SF per Trip |
| Police Building Cost | $230 per SF |

| | | West Jordan | | Infrastructure Needed | | |
|---|---|---|---|---|---|---|
| | Year | Population | NonRes Vehicle Trips | Police SF Residential | Police SF Non Residential | Total Police SF |
| Base Year | 2015 | 106,021 | 83,307 | 43,236 | 4,801 | 48,037 |
| Year 1 | 2016 | 107,878 | 85,038 | 43,993 | 4,901 | 48,894 |
| Year 2 | 2017 | 109,734 | 86,769 | 44,750 | 5,000 | 49,750 |
| Year 3 | 2018 | 111,591 | 88,500 | 45,507 | 5,100 | 50,607 |
| Year 4 | 2019 | 113,447 | 90,231 | 46,264 | 5,200 | 51,464 |
| Year 5 | 2020 | 115,304 | 91,962 | 47,021 | 5,300 | 52,321 |
| Year 6 | 2021 | 117,470 | 93,693 | 47,905 | 5,400 | 53,305 |
| *Six-Year Increase =>* | | 11,449 | 10,386 | 4,669 | 599 | 5,268 |
| Total Growth-Related Cost of Police Facilities => | | | | | **$1,211,640** | |

## DEBT SERVICE CREDIT EVALUATION

In 2004, West Jordan bond financed the construction of the West Jordan Justice Center. This bond was refinanced in 2014. Additionally, the City used a Sales Tax Revenue Bond issued in 2013 to finance construction of Station 54. To avoid potential double payment for law enforcement improvements, a

credit is necessary because new residential and nonresidential units that will pay the impact fee will also contribute to future principal payments on this remaining debt.

As shown in Figure 26, outstanding debt for the Justice Center portion of the City's 2004 bond issue is $4,111,470. Credit amounts are distributed based on proportionate share for residential and nonresidential uses. To derive the credit amount for residential, annual principal payments are multiplied by the proportionate share and divided by the projected total population. For example, in fiscal year 2017, the police-related principal to be paid of approximately $410,818 for the Justice Center is multiplied by the proportionate share of 90% and then divided by the projected total population of 109,734 for a payment of 3.37 per person. Similarly, the payment for nonresidential growth is derived by multiplying the principal payment by proportionate share and divided by the total number of projected nonresidential vehicle trips.

To account for the time value of money, annual payments per person are discounted using a net present value formula based on an average current interest rate of 2.28 percent. The total net present value of future principal payments per person is $28.72 per person and $4.02 per vehicle trip. This amount is subtracted from the gross capital cost per person amount to derive a net capital cost per person for police facilities.

### Figure 26. Police Principal Payment Credit Evaluation: Justice Center

***2004 General Obligation Bond (refinanced 2014)***

| Year | Principal Payments | Law Enf. Share* | Projected Population | NonRes Vehicle Trips | Principal Payment Credit | |
|---|---|---|---|---|---|---|
| | | | | | Per Person | Per Nonres. Trip |
| | | | | | *90.0%* | *10.0%* |
| FY 15-16 | $753,542 | $410,042 | 106,021 | 83,307 | $3.48 | $0.49 |
| FY 16-17 | $752,156 | $409,288 | 107,878 | 85,038 | $3.41 | $0.48 |
| FY 17-18 | $754,968 | $410,818 | 109,734 | 86,769 | $3.37 | $0.47 |
| FY 18-19 | $756,396 | $411,595 | 111,591 | 88,500 | $3.32 | $0.46 |
| FY 19-20 | $756,721 | $411,772 | 113,447 | 90,231 | $3.27 | $0.46 |
| FY 20-21 | $760,258 | $413,696 | 115,304 | 91,962 | $3.23 | $0.45 |
| FY 21-22 | $756,858 | $411,846 | 117,470 | 93,693 | $3.16 | $0.44 |
| FY 22-23 | $756,558 | $411,683 | 119,636 | 95,424 | $3.10 | $0.43 |
| FY 23-24 | $754,183 | $410,391 | 121,802 | 97,155 | $3.03 | $0.42 |
| FY 24-25 | $754,090 | $410,340 | 123,968 | 98,886 | $2.98 | $0.41 |
| Total | $7,555,730 | $4,111,470 | | | $32.35 | $4.52 |
| | | | *Discount Rate* | | *2.28%* | *2.28%* |
| | | | **Present Value** | | **$28.72** | **$4.02** |

*2004 General Obligation Bond for new Justice Center. 61.9% of the bond is for the Justice Center. This bond was refinanced in 2014. Law Enforcement share is based on the percentage of space (88%) that Police utilizes of the Justice Center.

Additionally, in 2013, West Jordan issued a sales tax revenue bond for construction of Station 54. The share of the bond that went towards police-related (as opposed to fire) was determined, using square footage totals, to equal 40 percent of the total issue. To avoid potential double payment for fire station cost recovery, a credit is necessary because new residential units and commercial developments that will pay the impact fee will also contribute to future principal payments on this remaining debt through sales tax revenue.

As shown in Figure 27, the share of outstanding debt attributable to fire is $1,086,696. To derive the credit amount, annual principal payments are multiplied by the proportionate share and divided by the projected total population or nonresidential trips for residential and nonresidential, respectively. For example, in fiscal year 2022, the principal to be paid of approximately $143,823 is multiplied by 90 percent and divided by the projected population of 119,636 for a payment of $1.08 per person for residential.

To account for the time value of money, annual payments per person are discounted using a net present value formula based on an average current interest rate of 2.28 percent. The total net present value of future principal payments is $7.71 per person and $1.08 per nonresidential. This amount is subtracted from the gross capital cost per person for residential and per trip for commercial to derive a net capital cost for police facilities for those categories.

**Figure 27. Police Principal Payment Credit Evaluation: Station 54**

***Sales Tax Revenue Bonds, Series 2013***

| Year | Principal Payments * | Projected Population | Projected NonRes | Principal Payment Credit | |
|---|---|---|---|---|---|
| | | | | Per Person | Per NonRes Trip |
| | | | | *90.0%* | *10.0%* |
| FY 16-17 | $123,851 | 107,878 | 85,038 | $1.03 | $0.15 |
| FY 17-18 | $127,847 | 109,734 | 86,769 | $1.05 | $0.15 |
| FY 18-19 | $129,844 | 111,591 | 88,500 | $1.05 | $0.15 |
| FY 19-20 | $133,839 | 113,447 | 90,231 | $1.06 | $0.15 |
| FY 20-21 | $137,835 | 115,304 | 91,962 | $1.08 | $0.15 |
| FY 21-22 | $141,830 | 117,470 | 93,693 | $1.09 | $0.15 |
| FY 22-23 | $143,827 | 119,636 | 95,424 | $1.08 | $0.15 |
| FY 23-24 | $147,823 | 121,802 | 97,155 | $1.09 | $0.15 |
| Total | $1,086,696 | Discount Rate | | 2.28% | 2.28% |
| | | ***Present Value*** | | ***$7.71*** | ***$1.08*** |

**Police share of Station 54 by square footage (5,841 police SF / 14,619 total SF = 40% of total square feet devoted to police activities)*

## POLICE IMPACT FEE CALCULATIONS

Proposed law enforcement impact fees are shown in Figure 28. For residential development, law enforcement impact fees are based on unit type and persons per housing unit. For example, the proposed law enforcement fee for multifamily housing units is $116 per unit (2.03 persons per housing unit x $57.36 net cost per person = $116 (truncated)). The fee for single family units is $203 and is calculated in the same fashion. In the case of residential, the net cost per person has a debt service credit for both the Justice Center and Station 54 bond principal payments ($7.71 + $28.72 = $36.43).

For nonresidential development, the fees are expressed per thousand square feet of floor area. Therefore, an office building with 30,000 square feet of floor area would pay a police impact fee of $2,280 (i.e., 30 x $76). The $76 fee per thousand feet is calculated using the $9.24 net cost per nonresidential vehicle trip (8.3 weekday trips per KSF x $9.24 = $76 per KSF (truncated)). Note that this net cost only includes a credit for the Justice Center bond. Industrial KSF fees are calculated using the same net cost per demand unit. For commercial uses, the net cost per demand unit is reduced by the debt service credit

for the Justice Center bond and the 2013 sales tax revenue bond for Station 54, yielding a total cost per demand unit of $8.16. Changes from current fees are included below.

## Figure 28. Proposed Police Impact Fee

| ***Residential*** | Per Person |
|---|---|
| Police Building Cost | $93.79 |
| Debt Service Credit | ($36.43) |
| Net Cost Per Demand Unit | $57.36 |

***Residential Impact Fees per Housing Unit***

| *Unit Type* | *Persons per Housing Unit* | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|
| Single Family | 3.55 | **$203** | $134 | $69 |
| Multifamily | 2.03 | **$116** | $89 | $27 |

| ***Nonresidential*** | Per Vehicle Trip | Per Vehicle Trip (for Commercial) |
|---|---|---|
| Police Building Cost | $13.25 | $13.25 |
| Debt Service Credit | ($4.02) | ($5.10) |
| Net Cost Per Demand Unit | $9.24 | $8.16 |

***Per 1,000 Square Feet of Floor Area***

| *ITE Code* | *Development Type* | *Weekday Trip per KSF* [1] | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|---|
| 820 | Commercial | 14.52 | **$118** | $182 | ($64) |
| 710 | Office | 8.30 | **$76** | $71 | $5 |
| 140 | Industrial | 1.91 | **$17** | $52 | ($35) |
| 150 | Warehousing | 1.78 | **$16** | - | - |
| 610 | Hospital | 6.61 | **$61** | - | - |
| 620 | Nursing Home | 3.80 | **$35** | - | - |

***Per Bed***

| *ITE Code* | *Development Type* | *Trips per Bed* | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|---|
| 254 | Assisted Living | 1.33 | **$12** | - | - |

***Per Room***

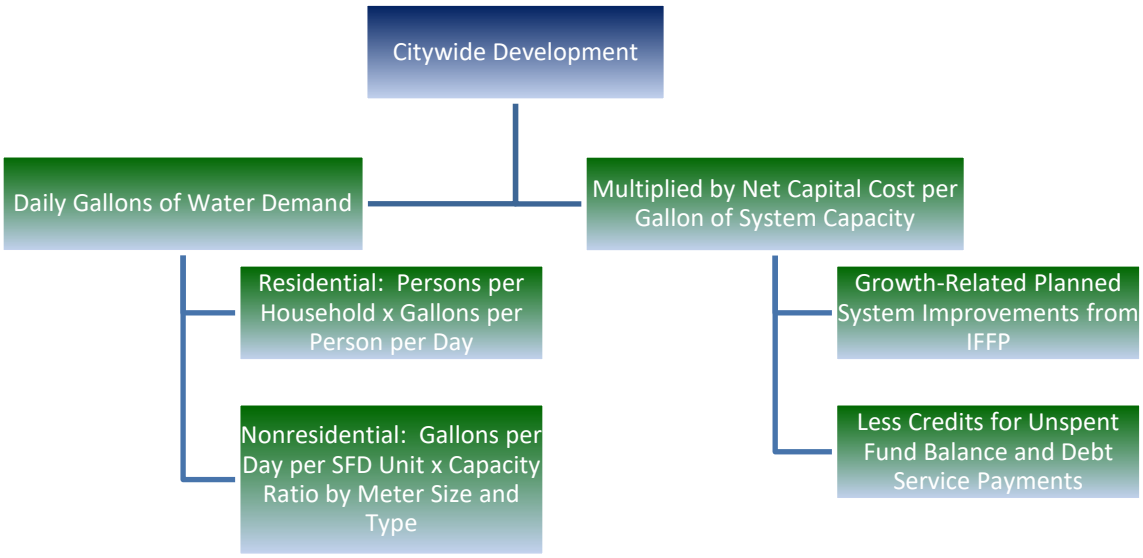
| *ITE Code* | *Development Type* | *Trips per Room* | ***Proposed Fee*** | *Current Fee* | *Increase / (Decrease)* |
|---|---|---|---|---|---|
| 320 | Motel | 2.82 | **$25** | - | - |

# Water

## METHODOLOGY

Water impact fees are derived using a plan-based approach. As shown in Figure 29, residential impact fees are based on the persons per household, the gallons per person per day, and the net capital cost per gallon of system capacity. Impact fees paid by nonresidential development are derived from capacity ratios according to the size of the new customer's water meter (up to 3 inches). Capacity ratios were obtained from the American Water Works Association (AWWA). Cost per gallon capacity are based on the cost of water transmission, reservoirs, and wells and pump stations projects within the six-year Impact Fee Facility Plan (published under separate cover) horizon.

**Figure 29. Water Impact Fee Methodology**




## LEVEL OF SERVICE ANALYSIS FOR WATER DEMAND

Water use by current customers was determined from the City's utility billing records. The number of utility customers (the City does not differentiate between water and wastewater customers) and use for 2015 is shown in Figure 30. West Jordan has an estimated 30,920 customers with average daily demand of 17.3 million gallons per day. This equates to average daily demand of 559 gallons per day per connection, including 492 gallons per single family unit and 218 gallons per multifamily unit. Per capita gallons per day for residential units is also shown in Figure 30 and total 139 gallons per day for single family units and 107 gallons per capita for multifamily.

### Figure 30. Average Day Water System Demand

| Unit Type | Gallons/Day | Units/ Customers | Gallons/ Unit or Customer | Gallons Per Day Per Capita |
|---|---|---|---|---|
| Single Family | 10,465,107 | 21,252 | 492 | 139 |
| Multifamily | 1,788,688 | 8,204 | 218 | 107 |
| Nonresidential | 5,042,225 | 1,464 | 3,444 | |
| Total | 17,296,019 | 30,920 | 559 | |

Source: City of West Jordan Public Works

## PROJECTION OF WATER SYSTEM DEMAND

Annual water demand projections are shown in Figure 31. Projected water demand is a function of the development projections (discussed in Appendix A, Figure A17) and the water demand factors shown above in Figure 30. Nonresidential demand is projected using an average jobs per connection calculation. Based on the projected increase in utility customers shown below, water demand will be approximately 24.9 million gallons per day (MGD) by 2035.

### Figure 31. Projected Water System Demand

| Year | | Avg. Gallons per Day | SFU Customers | MFU Customers | NonRes Customers | Total Customers | Annual Increase | | Cumulative Increase | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Customers | Avg. Gallons per Day | Customers | Avg. Gallons per Day |
| Base | 2015 | 17,296,019 | 21,252 | 8,204 | 1,464 | 30,920 | | | | |
| 1 | 2016 | 17,646,855 | 21,672 | 8,384 | 1,494 | 31,550 | 630 | 350,835 | 630 | 350,835 |
| 2 | 2017 | 17,997,690 | 22,092 | 8,564 | 1,525 | 32,181 | 630 | 350,835 | 1,261 | 701,671 |
| 3 | 2018 | 18,348,525 | 22,512 | 8,744 | 1,555 | 32,811 | 630 | 350,835 | 1,891 | 1,052,506 |
| 4 | 2019 | 18,699,361 | 22,932 | 8,924 | 1,586 | 33,442 | 630 | 350,835 | 2,522 | 1,403,342 |
| 5 | 2020 | 19,050,196 | 23,352 | 9,104 | 1,616 | 34,072 | 630 | 350,835 | 3,152 | 1,754,177 |
| 6 | 2021 | 19,442,042 | 23,842 | 9,314 | 1,647 | 34,803 | 730 | 391,846 | 3,883 | 2,146,023 |
| 7 | 2022 | 19,833,889 | 24,332 | 9,524 | 1,677 | 35,533 | 730 | 391,846 | 4,613 | 2,537,869 |
| 8 | 2023 | 20,225,735 | 24,822 | 9,734 | 1,707 | 36,263 | 730 | 391,846 | 5,343 | 2,929,716 |
| 9 | 2024 | 20,617,581 | 25,312 | 9,944 | 1,738 | 36,994 | 730 | 391,846 | 6,074 | 3,321,562 |
| 10 | 2025 | 21,009,427 | 25,802 | 10,154 | 1,768 | 37,724 | 730 | 391,846 | 6,804 | 3,713,408 |
| 11 | 2026 | 21,401,273 | 26,292 | 10,364 | 1,799 | 38,455 | 730 | 391,846 | 7,535 | 4,105,254 |
| 12 | 2027 | 21,793,120 | 26,782 | 10,574 | 1,829 | 39,185 | 730 | 391,846 | 8,265 | 4,497,101 |
| 13 | 2028 | 22,184,966 | 27,272 | 10,784 | 1,859 | 39,915 | 730 | 391,846 | 8,995 | 4,888,947 |
| 14 | 2029 | 22,576,812 | 27,762 | 10,994 | 1,890 | 40,646 | 730 | 391,846 | 9,726 | 5,280,793 |
| 15 | 2030 | 22,968,658 | 28,252 | 11,204 | 1,920 | 41,376 | 730 | 391,846 | 10,456 | 5,672,639 |
| 16 | 2031 | 23,360,505 | 28,742 | 11,414 | 1,951 | 42,107 | 730 | 391,846 | 11,187 | 6,064,485 |
| 17 | 2032 | 23,752,351 | 29,232 | 11,624 | 1,981 | 42,837 | 730 | 391,846 | 11,917 | 6,456,332 |
| 18 | 2033 | 24,144,197 | 29,722 | 11,834 | 2,012 | 43,568 | 730 | 391,846 | 12,648 | 6,848,178 |
| 19 | 2034 | 24,536,043 | 30,212 | 12,044 | 2,042 | 44,298 | 730 | 391,846 | 13,378 | 7,240,024 |
| 20 | 2035 | 24,927,890 | 30,702 | 12,254 | 2,072 | 45,028 | 730 | 391,846 | 14,108 | 7,631,870 |

Source: TischlerBise, using projected development shown in Figure A17 of Appendix A, and demand factors from previous figure.

## PLANNED WATER SYSTEM IMPROVEMENTS

### *Transmission*

Figure 32 indicates the City's capital plan for transmission projects over the next six years. Distribution projects total $5,231,000, as determined by the West Jordan Department of Public Works. This figure was then multiplied by a growth share delineated in the City's capital plan to determine the growth-related

costs within the IFFP horizon for each project (total of $2,530,200). The cost per gallon of capacity of $1.18 was calculated by dividing total growth-related costs of future transmission projects by the anticipated gallons per day of capacity demanded over the next six years ($2,530,200 / 2,146,023 gallons = $1.18). Based on the projection of future water system demands (shown above in Figure 31) from the base year (2015) to 2021 (the end of the IFFP horizon), TischlerBise estimates the impact fee will raise approximately $2.5 million of revenues, or 48 percent of total transmission project costs.

**Figure 32. Water Capital Facility Program-Transmission**

| *Fiscal Year* | *2015 MP #* | *Project* | *Total Project Cost* | *Growth Share* | *Growth-Related Costs within IFFP Horizon* |
|---|---|---|---|---|---|
| FY18-19 | BD-10 | NBH Transmission Project | $905,000 | 100% | $905,000.00 |
| FY18-19 | BD-1 | 16 inch Zone 3 Transmission WL | $950,000 | 100% | $950,000.00 |
| FY19-20 | D-21 | OBH Transmission Project | $3,376,000 | 20% | $675,200.00 |
| | | | $5,231,000 | | $2,530,200 |
| | | | | *Projected Increase in Demanded Capacity (2015-2021)* | 2,146,023 |
| | | | | *Cost per Gallon of Capacity* | ***$1.18*** |
| | | | | *Projected Impact Fee Revenue (2015-2021)* | $2,530,200 |
| | | | | *Percentage Share of Total Cost of Planned Improvements* | 48% |

### *Reservoirs*

Figure 33 indicates the City's capital plan for reservoir projects over the next six years. Reservoir projects total $13.88 million, as determined by the West Jordan Department of Public Works. The cost per gallon of capacity of $1.39 was calculated by dividing total cost of future reservoir projects by the anticipated gallons of capacity added to the system ($13,880,000 / 10,000,000 gallons = $1.39). Capacity estimates were provided by the Department of Public Works and derived from the City's water system modelling efforts. Total capacity added is only included for constructed projects. Based on the projection of future water system demands (shown above in Figure 31) from the base year (2015) to 2021 (the end of the IFFP horizon), TischlerBise estimates the impact fee would raise approximately $2.98 million of revenues, or 21 percent of total reservoir project costs.

### Figure 33. Water Capital Facility Program-Reservoirs

| Fiscal Year | 2015 MP # | Project | Total Project Cost | Capacity (GPD) | Cost per Gallon of Capacity | Growth-Related Costs within IFFP Horizon |
|---|---|---|---|---|---|---|
| FY16-17 -- FY18-19 | S-5 | Terminal Reservoir Property, Design, and Construction | $4,410,000 | 3,000,000 | $1.47 | $946,396 |
| FY17-18 -- FY18-19 | S-14 | Z3 North Reservoir Design, Property, and Construction | $4,170,000 | 3,000,000 | $1.39 | $894,892 |
| FY19-20 -- FY20-21 | S-4 | OBH Z3 Reservoir Design and Construction | $5,100,000 | 4,000,000 | $1.28 | $1,094,472 |
| FY20-21 | S-8 | Z5 North Reservoir Design | $200,000 | - | - | $42,920 |
| | | | $13,880,000 | 10,000,000 | ***$1.39*** | |
| | | *Projected Increase in Demanded Capacity (2015-2021)* | | | 2,146,023 | |
| | | *Projected Impact Fee Revenue (2015-2021)* | | | $2,978,680 | |
| | | *Percentage Share of Total Cost of Planned Improvements* | | | 21% | |

### *Wells and Pump Stations*

Figure 34 indicates the City's capital plan for well and pump station projects over the next six years. These projects total approximately $4.2 million, as determined by the West Jordan Department of Public Works. The cost per gallon of capacity of $1.94 was calculated by dividing total cost of future reservoir projects by the anticipated gallons of capacity added to the system ($4,193,707 / 2,160,000 gallons = $1.94). Capacity estimates were provided by the Department of Public Works and derived from the City's water system modelling efforts. Total gallons of capacity added to the system only includes capacity from wells coming on line. Based on the projection of future water system demands (shown above in Figure 31) from the base year (2015) to 2021 (the end of the IFFP horizon), TischlerBise estimates the impact fee would raise approximately $4.17 million of revenues, or 99 percent of total reservoir project costs.

### Figure 34. Water Capital Facility Program-Wells and Pump Stations

| Fiscal Year | 2015 MP # | Project | Total Project Cost | Capacity (GPD) | Cost per Gallon of Capacity | Growth-Related Costs within IFFP Horizon |
|---|---|---|---|---|---|---|
| FY16-17 | W-23 | Veterans Park Well Replacement | $453,707 | 720,000 | $0.63 | $450,771 |
| FY16-17 | W-20 | Drill Exploratory Wells (2) | $200,000 | - | - | $198,706 |
| FY16-17 | W-18 | Well 6 - Generator & Upgrades | $300,000 | - | - | $298,059 |
| FY16-17 | W-7 | New U-111 well & pump house | $1,620,000 | 720,000 | $2.25 | $1,609,517 |
| FY17-18 | W-8 | New Terminal well & pump house | $1,620,000 | 720,000 | $2.25 | $1,609,517 |
| | | | $4,193,707 | 2,160,000 | ***$1.94*** | |
| | | *Projected Increase in Demanded Capacity (2015-2021)* | | | 2,146,023 | |
| | | *Projected Impact Fee Revenue (2015-2021)* | | | *$4,166,571* | |
| | | *Percentage Share of Total Cost of Planned Improvements* | | | 99% | |

## WATER IMPACT FEES

Input variables for the water impact fees are shown in the upper section of Figure 35. Residential fees are calculated by multiplying the number of persons per household by type of housing unit by the average number of gallons per person per day for that unit type. The average number of gallons per housing unit is then multiplied by the net capital cost per gallon of system capacity. For example, the fee calculation for a single family housing unit is 3.55 persons per housing unit x 139 gallons per person per day = 492 gallons per day per housing unit (rounded). This figure is then multiplied by the net capital cost per gallon of $4.51 for a water impact fee of $2,220. Nonresidential fees are based on size and type of water meter and their restrictive capacity. The capacity ratios by meter size and type are from the American Water Works Association (AWWA). The water demands of an average single family housing unit are used as the basis of the calculation. For meters greater than three inches, fees are calculated by multiplying the capital cost per gallon by expected demand, since capacity ratios are no longer representative of the true cost of demand as a function of single family demand.

### Figure 35. Water Impact Fees

| ***Level Of Service*** | *Standards:* |
|---|---|
| Single Family Gallons per Person per Day | 139 |
| Multifamily Gallons per Person per Day | 107 |
| Capital Cost per Gallon-Wells and Pump Stations | $1.94 |
| Capital Cost per Gallon-Reservoirs | $1.39 |
| Capital Cost per Gallon-Transmission | $1.18 |
| Capital Cost per Gallon | **$4.51** |

***Residential Impact Fees per Housing Unit***

| *Unit Type* | *Persons per Housing Unit* | ***Proposed Fee*** | ***Current Fee*** | ***Increase/ (Decrease)*** |
|---|---|---|---|---|
| Single Family | 3.55 | **$2,220** | $1,922 | $298 |
| Multifamily | 2.03 | **$982** | $1,276 | ($294) |

| **Nonresidential** | | | **Per Meter** | | |
|---|---|---|---|---|---|
| *Meter Size (inches)** | | *Capacity Ratio* | | | |
| 0.75 | Displacement | 1.0 | **$2,220** | $1,922 | $298 |
| 1.00 | Displacement | 1.7 | **$3,774** | $3,266 | $508 |
| 1.50 | Sonar | 3.3 | **$7,326** | $6,341 | $985 |
| 2.00 | Sonar | 5.3 | **$11,766** | $10,184 | $1,582 |
| 3.00 | Sonar | 10.7 | **$23,755** | $20,651 | $3,104 |

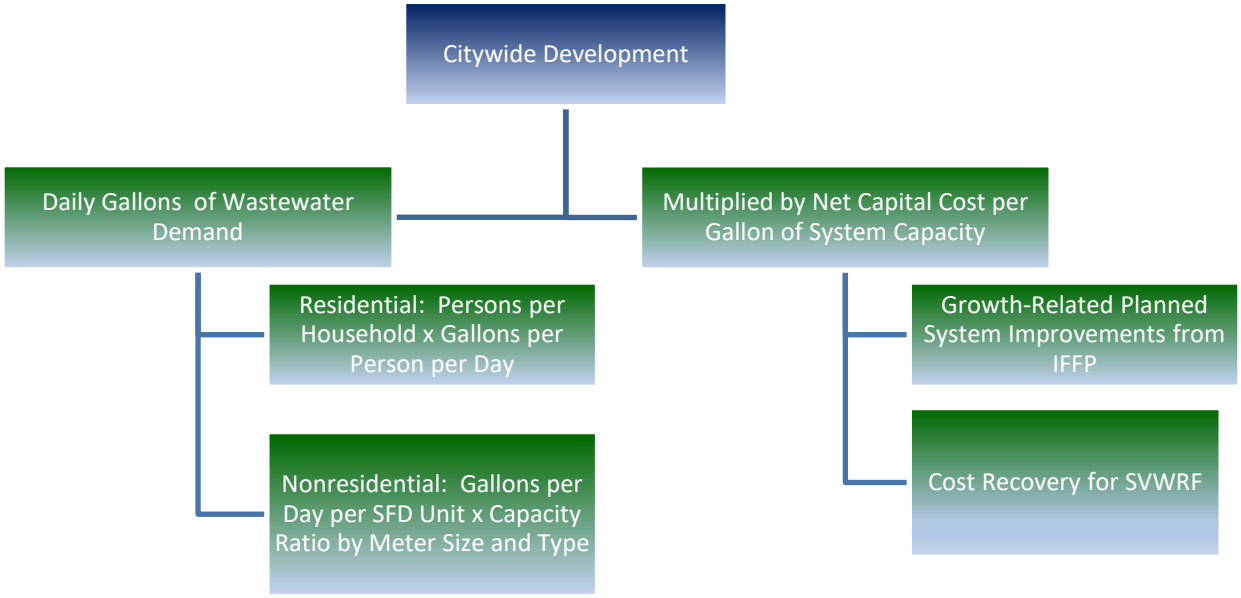
*Fees for meters larger than three inches will be based on annualized average day demand and the net capital cost per gallon of capacity.

# Wastewater

## METHODOLOGY

Wastewater impact fees are derived using a plan-based approach for collection and a cost recovery approach for treatment. As shown in Figure 36, the impact fees are based on the average daily gallons of wastewater flow demand for a single-family housing unit and the net capital cost per gallon of system capacity. Wastewater impact fees are based on the cost of wastewater collection and treatment. Impact fees paid by nonresidential development are derived from capacity ratios according to the size of the new customer's water meter. Capacity ratios were obtained from the American Water Works Association (AWWA).

**Figure 36. Wastewater Impact Fee Methodology**




## LEVEL OF SERVICE ANALYSIS FOR WASTEWATER DEMAND

As noted above in the Water chapter, the City does not differentiate between water and sewer customers. Since water and sewer consumption typically correlate, TischlerBise used the average daily sewer flow at the South Valley Water Reclamation Facility (SVWRF), which serves West Jordan City, to scale water demand by land use type metrics described in Figure 30 above to sewer demand. The average daily sewer flow for West Jordan City to SVWRF is 8.5 million gallons. Thus, the water demand breakdown is used to allocate the 8.5 million gallons to single family, multifamily, and nonresidential development. Customer counts remain the same.

Demand calculations are shown in Figure 37. Average daily demand is 275 gallons per day per connection, or 242 gallons per single family unit and 107 gallons per multifamily unit. Per capita gallons per day for

residential unit is also shown in Figure 37 and total 68 gallons per day for single family units and 53 gallons per capita for multifamily.

### Figure 37. Average Day Wastewater System Demand

| Unit Type | Gallons/Day* | Water Demand Breakdown | Units/ Customers | Gallons/ Unit or Customer | Gallons Per Day Per Capita |
|---|---|---|---|---|---|
| Single Family | 5,142,999 | 0.61 | 21,252 | 242 | 68 |
| Multifamily | 879,037 | 0.10 | 8,204 | 107 | 53 |
| Nonresidential | 2,477,964 | 0.29 | 1,464 | 1,693 | |
| Total | 8,500,000 | | 30,920 | 275 | |

*Total gallons/day figure provided by City of West Jordan Public Works; demand is divided among unit type using water demand percentages

## PROJECTION OF WASTEWATER SYSTEM DEMAND

Projected wastewater demand is a function of the development projections (discussed in Appendix A, Figure A14) and the wastewater demand factors shown above in Figure 37 (68 gallons per day per person for single family units and 53 gallons per day per person for multifamily units). Nonresidential demand is projected using an average jobs per connection calculation. Based on the increase in wastewater customers shown below, wastewater system demand will be approximately 12.3 million gallons per day (MGD) by 2035.

### Figure 38. Projected Wastewater System Demand

| Year | | Avg. Gallons per Day | SFU Customers | MFU Customers | NonRes Customers | Total Customers | Annual Increase | | Cumulative Increase | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Customers | Avg. Gallons per Day | Customers | Avg. Gallons per Day |
| Base | 2015 | 8,500,000 | 21,252 | 8,204 | 1,464 | 30,920 | | | | |
| 1 | 2016 | 8,672,415 | 21,672 | 8,384 | 1,494 | 31,550 | 630 | 172,415 | 630 | 172,415 |
| 2 | 2017 | 8,844,831 | 22,092 | 8,564 | 1,525 | 32,181 | 630 | 172,415 | 1,261 | 344,831 |
| 3 | 2018 | 9,017,246 | 22,512 | 8,744 | 1,555 | 32,811 | 630 | 172,415 | 1,891 | 517,246 |
| 4 | 2019 | 9,189,662 | 22,932 | 8,924 | 1,586 | 33,442 | 630 | 172,415 | 2,522 | 689,662 |
| 5 | 2020 | 9,362,077 | 23,352 | 9,104 | 1,616 | 34,072 | 630 | 172,415 | 3,152 | 862,077 |
| 6 | 2021 | 9,554,647 | 23,842 | 9,314 | 1,647 | 34,803 | 730 | 192,570 | 3,883 | 1,054,647 |
| 7 | 2022 | 9,747,217 | 24,332 | 9,524 | 1,677 | 35,533 | 730 | 192,570 | 4,613 | 1,247,217 |
| 8 | 2023 | 9,939,787 | 24,822 | 9,734 | 1,707 | 36,263 | 730 | 192,570 | 5,343 | 1,439,787 |
| 9 | 2024 | 10,132,357 | 25,312 | 9,944 | 1,738 | 36,994 | 730 | 192,570 | 6,074 | 1,632,357 |
| 10 | 2025 | 10,324,927 | 25,802 | 10,154 | 1,768 | 37,724 | 730 | 192,570 | 6,804 | 1,824,927 |
| 11 | 2026 | 10,517,497 | 26,292 | 10,364 | 1,799 | 38,455 | 730 | 192,570 | 7,535 | 2,017,497 |
| 12 | 2027 | 10,710,067 | 26,782 | 10,574 | 1,829 | 39,185 | 730 | 192,570 | 8,265 | 2,210,067 |
| 13 | 2028 | 10,902,637 | 27,272 | 10,784 | 1,859 | 39,915 | 730 | 192,570 | 8,995 | 2,402,637 |
| 14 | 2029 | 11,095,206 | 27,762 | 10,994 | 1,890 | 40,646 | 730 | 192,570 | 9,726 | 2,595,206 |
| 15 | 2030 | 11,287,776 | 28,252 | 11,204 | 1,920 | 41,376 | 730 | 192,570 | 10,456 | 2,787,776 |
| 16 | 2031 | 11,480,346 | 28,742 | 11,414 | 1,951 | 42,107 | 730 | 192,570 | 11,187 | 2,980,346 |
| 17 | 2032 | 11,672,916 | 29,232 | 11,624 | 1,981 | 42,837 | 730 | 192,570 | 11,917 | 3,172,916 |
| 18 | 2033 | 11,865,486 | 29,722 | 11,834 | 2,012 | 43,568 | 730 | 192,570 | 12,648 | 3,365,486 |
| 19 | 2034 | 12,058,056 | 30,212 | 12,044 | 2,042 | 44,298 | 730 | 192,570 | 13,378 | 3,558,056 |
| 20 | 2035 | 12,250,626 | 30,702 | 12,254 | 2,072 | 45,028 | 730 | 192,570 | 14,108 | 3,750,626 |

Source: TischlerBise, using projected development shown in Figure A17 of Appendix A, and demand factors from previous figure.

## PLANNED WASTEWATER COLLECTION IMPROVEMENTS

Figure 39 indicates the City's capital plan for transmission projects over the next six years. This figure was then multiplied by a growth share delineated in the City's capital plan to determine the growth-related costs within the IFFP horizon for each project (total of $4,182,830). The cost per gallon of capacity of $3.97 was calculated by dividing total growth-related costs of future transmission projects by the anticipated gallons per day of capacity demanded over the next six years ($4,182,830 / 1,054,647 gallons = $3.97). Based on the projection of future wastewater system demands (shown above in Figure 38) from the base year (2015) to 2021 (the end of the IFFP horizon), TischlerBise estimates the impact fee will raise $4.2 million, or 60 percent of total collection project costs.

### Figure 39. Wastewater Facility Program-Collection

| Fiscal Year | MP Project # | Project | Total Project Cost | Growth Share | Growth-Related Costs within IFFP |
|---|---|---|---|---|---|
| FY16-17 | 5 | TOD 18" Pipeline OBH upsize | $105,000 | 100% | $105,000 |
| FY16-17 | 21 | Wells Park Rd. Upgrade (pipe burst) | $500,000 | 100% | $500,000 |
| FY16-17 | 23 | 7000 South Upgrades 1905 W to 3200 W | $1,950,000 | 44% | $858,000 |
| FY17-18 | 4b | 1300 West Pipe Burst Sewer upgrade | $1,080,000 | 12% | $129,600 |
| FY17-18 | 15a | Mountain Meadow Pipe Upsize | $75,000 | 12% | $9,000 |
| FY17-18 | 13 | Upsize Pipe in Center Park, Campus View | $1,071,000 | 88% | $942,480 |
| FY21-22 | 21 | Wells Park and Hawley Park Upgrades | $1,675,000 | 85% | $1,423,750 |
| FY21-22 | 22 | 9000 S - 30 inch upgrade (610LF) 1100 W | $500,000 | 43% | $215,000 |
| | | Total | $6,956,000 | | $4,182,830 |
| | | *Projected Increase in Demanded Capacity (2015-2021)* | | | 1,054,647 |
| | | *Cost per Gallon of Capacity* | | | ***$3.97*** |
| | | *Projected Impact Fee Revenue (2015-2021)* | | | $4,182,830 |
| | | *Percentage Share of Total Cost of Planned Improvements* | | | 60% |

## SVWRF COST RECOVERY

In 2005, West Jordan issued a Water Revenue Bond to finance an addition to the South Valley Water Reclamation Facility (SVWRF), a 50 million gallon per day (MGD) wastewater treatment plant. The debt financed a 7.52 MGD capacity addition to the plan. This bond was refinanced in 2014. In total, this 7.52 MGD share of SVWRF capacity will cost the City approximately $30.2 million (Figure 40).

This portion of the wastewater impact fee will be used to cover new development's share of the SVWRF debt service payments. To calculate the cost per gallon of treatment capacity, TischlerBise divided the total cost of the City's debt ($30,180,876) by the total gallons of capacity in West Jordan's purchased share of the SVWRF (7,520,000), yielding a total cost per gallon of treatment of $4.01. Based on the City's expected usage over the next six years, this impact fee will generate $4.2 million in revenue (Figure 40).

**Figure 40. SVWRF Remaining Debt Service**

**Series 2005 (Refunded in 2014)**

| *Year* | *Principal & Interest** |
|---|---|
| 2006 | $467,001 |
| 2007 | $821,046 |
| 2008 | $928,675 |
| 2009 | $983,313 |
| 2010 | $1,026,313 |
| 2011 | $1,092,125 |
| 2012 | $1,140,125 |
| 2013 | $1,184,975 |
| 2014 | $1,226,975 |
| 2015 | $626,667 |
| 2016 | $1,362,813 |
| 2017 | $1,377,013 |
| 2018 | $1,380,613 |
| 2019 | $1,377,013 |
| 2020 | $1,382,213 |
| 2021 | $1,379,013 |
| 2022 | $1,377,763 |
| 2023 | $1,379,263 |
| 2024 | $1,378,263 |
| 2025 | $1,379,763 |
| 2026 | $1,383,513 |
| 2027 | $1,382,963 |
| 2028 | $1,381,363 |
| 2029 | $1,382,144 |
| 2030 | $1,380,056 |
| ***Total*** | ***$30,180,976*** |

**Payments from both original and refunded debt service schedules*

| SVWRF Cost Recovery | |
|---|---|
| Total West Jordan Debt | $30,180,976 |
| Purchased Capacity (MGD) | 7.52 |
| Cost per Gallon of Treatment | **$4.01** |
| Projected Impact Fee Revenue (2015-2021) | $4,232,750 |

## WASTEWATER IMPACT FEES

Input variables for the wastewater impact fees are shown in the upper section of Figure 41. Residential fees are calculated by multiplying the number of persons per housing unit by type of housing unit by the average number of gallons per person per day. The average number of gallons per housing unit is then multiplied by the net capital cost per gallon of system capacity. For example, the calculation for a single family housing unit is 3.55 persons per housing unit x 68 gallons per person per day = 242 gallons per day per housing unit (rounded). This figure is then multiplied by the net capital cost per gallon of $7.98 for a wastewater impact fee of $1,931.

Nonresidential fees are based on size and type of meter and their restrictive capacity. The capacity ratios by meter size and type are from the American Water Works Association (AWWA). The demands of an average single family housing unit are used as the basis of the calculation. As with the water fee, for meters greater than three inches, fees are calculated by multiplying the capital cost per gallon by expected demand, since capacity ratios are no longer representative of the true cost of demand as a function of single family demand.

### Figure 41. Wastewater Impact Fees

| ***Level Of Service*** | *Standards:* |
|---|---|
| Single Family Gallons per Person per Day | 68 |
| Multifamily Gallons per Person per Day | 53 |
| Capital Cost per Gallon-Collection | $3.97 |
| Cost Recovery per Gallon - SVWRF | $4.01 |
| Capital Cost per Gallon | **$7.98** |

***Residential Impact Fees per Housing Unit***

| *Unit Type* | *Persons per Housing Unit* | ***Proposed Fee*** | ***Current Fee*** | ***Increase/ (Decrease)*** |
|---|---|---|---|---|
| Single Family | 3.55 | **$1,931** | $1,333 | $598 |
| Multifamily | 2.03 | **$855** | $885 | ($30) |

| **Nonresidential** | | | **Per Meter** | | |
|---|---|---|---|---|---|
| *Meter Size (inches)** | | *Capacity Ratio* | | | |
| 0.75 | Displacement | 1.0 | **$1,931** | $1,333 | $598 |
| 1.00 | Displacement | 1.7 | **$3,282** | $2,265 | $1,017 |
| 1.50 | Displacement | 3.3 | **$6,372** | $4,398 | $1,974 |
| 2.00 | Sonar | 5.3 | **$10,234** | $7,063 | $3,171 |
| 3.00 | Sonar | 10.7 | **$20,662** | $14,261 | $6,401 |

*Fees for meters larger than three inches will be based on annualized average day demand and the net capital cost per gallon of capacity.

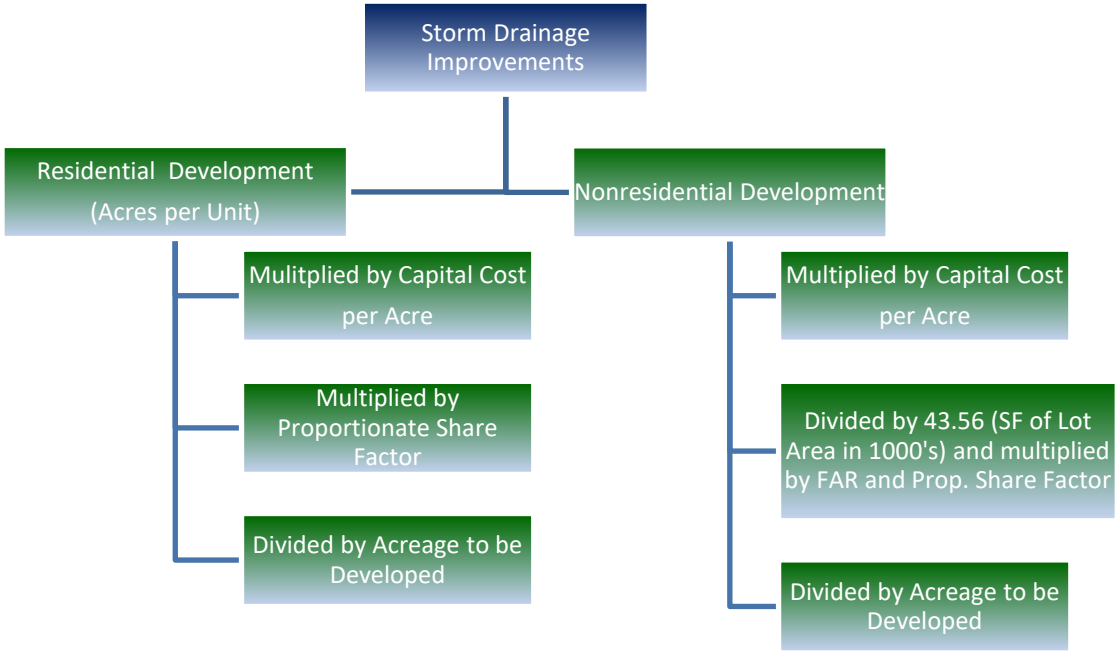
# Storm Drainage

## METHODOLOGY

The storm drainage impact fees are derived using a combination of the plan-based and cost recovery methodologies. Hansen, Allen, and Luce (HAL) and City staff identified storm drainage system improvements that will be necessary to accommodate the build-out of West Jordan. The growth-related cost of storm drainage system improvements within the IFFP (published under separate cover) horizon is allocated to the acreage expected to be developed based on demographic projections (Appendix A), prevailing dwelling units by acre, floor area ratio (FAR) by land use type, and typical impervious surface percentage [(based on the Salt Lake City Hydrology Manual (1993) and the City's *Storm Drainage Master Plan* (2014)]. FAR is the ratio of a building's total floor area to the size of the piece of land on which it is situated. For instance, a 5,000 sq.ft. building on a 20,000 sq. ft. parcel has an FAR of 0.25.

As shown in Figure 42, the capital cost of storm drainage improvements is multiplied by proportionate share factors for each type of land use and then divided by the amount of land area by type of land use. Residential fees per housing unit are based on a gross density of 4.6 units per acre for single family units and 12.5 units per acre for multifamily units, based on densities in the City of West Jordan's zoning ordinance and staff input. The capital cost per acre for nonresidential land uses was converted to a fee per 1,000 square feet (KSF) using an average FAR for retail development of 0.25, 0.33 for office, and 0.18 for industrial, based on FARs from the Land Use Element of the *West Jordan Comprehensive Plan (2010)*. It is preferable to base the nonresidential fees on floor area rather than use a per acre basis because the fee will increase or decrease according to the intensity of an individual project.

**Figure 42: Storm Drainage Impact Fee Methodology**



## GROWTH-RELATED STORM DRAINAGE IMPROVEMENTS

The Capital Facility Plan (CFP) from which the storm drainage impact fees are derived is shown below in the following figures. Figure 43 lists the trunkline projects, which have a total cost of $7.64 million. The growth-related portion of these costs is estimated at $1.76 million. Cost estimates and growth shares were provided by the West Jordan Public Works Department.

### Figure 43. Storm Drainage CFP - Trunkline Projects

| Fiscal Year | MP Project # | Project | Total Project Cost | Growth Share | Growth-Related Costs within IFFP Horizon |
|---|---|---|---|---|---|
| FY16-17 | 72 | 7000 S - 4600 W to Airport Rd (24 inch) | $275,000 | 100% | $275,000 |
| FY16-17 -- FY17-18 | 1 | 7000 South 60 inch trunkline | $5,497,900 | 10% | $549,790 |
| FY16-17 -- FY17-18 | 4 | Executive Drive - 7265 S to Richland Circle | $544,000 | 30% | $163,200 |
| FY19-20 | 14 | Harvest Ridge Dr. - 7400 S & Jordan Meadows | $175,000 | 10% | $17,500 |
| FY19-20 | 31 | 8660 South & 1841 West (Cajean Estates) | $150,000 | 100% | $150,000 |
| FY20-21 | 79 | OBH to Bingham Creek pipeline | $998,750 | 60% | $599,250 |
| | | Total | $7,640,650 | | **$1,754,740** |

*Source: Cost estimates and growth cost provided by West Jordan Public Works. See Impact Fee Facilities Plan for details.*

Figure 44 lists storm drainage detention projects, which have a total cost of $6.78 million. The growth-related portion of these costs is estimated at $4.84 million. Cost estimates and growth shares were provided by the West Jordan Public Works Department.

### Figure 44. Storm Drainage CFP – Detention Projects

| Fiscal Year | MP Project # | Project | Total Project Cost | Growth Share | Growth-Related Costs within IFFP Horizon |
|---|---|---|---|---|---|
| FY16-17 -- FY17-18 | 3 | Constitution Park detention expansion | $1,800,000 | 70% | $1,260,000 |
| FY16-17 | - | Relocate Barney's Wash Detention Pond | $2,000,000 | 30% | $600,000 |
| FY17-18 -- FY18-19 | - | Barney's Wash (Terminal) Detention (design and construction) | $1,080,000 | 100% | $1,080,000 |
| FY17-18 | 34 | Barney's Creek West Detention (design and construction) | $1,900,000 | 100% | $1,900,000 |
| | | Total | $6,780,000 | | **$4,840,000** |

*Source: Cost estimates and growth cost provided by West Jordan Public Works. See Impact Fee Facilities Plan for details.*

## COST RECOVERY ON CULVERT PROJECT

In addition to the planned trunkline and detention projects described above, the storm drainage fee includes a cost recovery component on the 4000 West Bingham Creek project. This culvert project, completed between 2013 and 2015, carried a total cost of $567,745. Storm drainage modelling efforts indicated that 35 percent of these costs were growth-related, yielding a total impact fee basis of $198,711. This total is included in the total cost of growth-related capital costs below in Figure 46.

## PROPORTIONATE SHARE FACTORS

The capital costs for the storm drain system are allocated to the land area served by the improvements. In order to determine the land area served by the storm drainage system, TischlerBise has applied average residential density and nonresidential FAR factors to projected development through the year 2021 to determine the amount of developed acreage by land use (Figure 45).

### Figure 45. Projected Increase in Acreage by Land Use to 2021

| | Net Increase in Residential and Nonresidential Acres (20-Year Projection) | | | | | | | 6-Year |
|---|---|---|---|---|---|---|---|---|
| | **Units** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **Net Increase** |
| | Single Family | 420 | 420 | 420 | 420 | 420 | 490 | **2,590** |
| | Multifamily | 180 | 180 | 180 | 180 | 180 | 210 | **1,110** |
| | **TOTAL** | **600** | **600** | **600** | **600** | **600** | **700** | **3,700** |
| | **Residential Acreage** | | | | | | | |
| **4.6 DU/Ac*** | Single Family Acres | 91 | 91 | 91 | 91 | 91 | 107 | **563** |
| **12.5 DU/Ac*** | Multifamily Acres | 14 | 14 | 14 | 14 | 14 | 17 | **89** |
| | **TOTAL** | **106** | **106** | **106** | **106** | **106** | **123** | **652** |
| | **Nonresidential Square Footage** | | | | | | | |
| | Commercial | 82,403 | 82,403 | 82,403 | 82,403 | 82,403 | 82,403 | **494,418** |
| | Office | 43,527 | 43,527 | 43,527 | 43,527 | 43,527 | 43,527 | **261,160** |
| | Industrial | 90,789 | 90,789 | 90,789 | 90,789 | 90,789 | 90,789 | **544,736** |
| | **TOTAL** | **216,719** | **216,719** | **216,719** | **216,719** | **216,719** | **216,719** | **1,300,314** |
| | **Nonresidential Acreage** | | | | | | | |
| **0.25 FAR**** | Retail Acres | 8 | 8 | 8 | 8 | 8 | 8 | **46** |
| **0.33 FAR**** | Office Acres | 3 | 3 | 3 | 3 | 3 | 3 | **18** |
| **0.18 FAR**** | Industrial Acres | 12 | 12 | 12 | 12 | 12 | 12 | **70** |
| | **TOTAL** | **22** | **22** | **22** | **22** | **22** | **22** | **133** |
| | **TOTAL NET INCREASE ACRES** | **128** | **128** | **128** | **128** | **128** | **146** | **785** |

**DU/Ac. = Dwelling Units per Acre; Densities from City of West Jordan Municipal Ordinance and represent average densities aligned with the* Storm Drainage Master Plan (2015). *For instance, for single family units the City's Zoning Ordinance (13-5B-3) lists single family residential zones calling for parcels ranging from 5,000 sq. ft. to 14,000 sq. ft. The mid-point of this range is 9,500 sq. ft., or 0.218 acres. This translates to 4.6 DU/Ac. The same calculation was made for multifamily residential, yielding a DU/Ac. of 12. This figure was adjusted up to 12.5 based on staff input.*
***FAR = Floor to Area Ratio; Average floor area ratios from Land Use Element of West Jordan Comprehensive Plan (2010), p. 57.*

Based on the projected increase in acreage by land use shown in the figure above, TischlerBise determined proportionate share factors by land use using weighting factors that represent the percentage of impervious surface area created in the drainage area by each type of land use. For example, there are 563 acres of land projected for single family housing unit development over the next six years, based on an

average density of 4.6 dwellings units per acre (2,590 units / 4.6 DU per ac.). The percentage of impervious surface is estimated at 35 percent, based on data contained in the *Salt Lake City Hydrology Manual* (1993) and the City's *Storm Drainage Master Plan* (2014), resulting in 197 impervious acres (563 developed acres X 35%). Based on projected development citywide, this represents 56.85 percent of the net increase in impervious acreage citywide over the next six years (197 impervious ac. from single family dev. / 347 ac. total). This calculation is shown in Figure 46. Costs are capitalized per acre by land use at the bottom of this figure.

**Figure 46. Proportionate Share and Capital Cost per Acre**

| System Improvements Sized For Citywide Service within IFFP Horizon | | | | |
|---|---|---|---|---|
| | | | *Growth-Related Capital Costs within IFFP Horizon - Trunklines* | $1,754,740 |
| | | | *Growth-Related Capital Costs within IFFP Horizon - Detention* | $4,840,000 |
| | | | *Growth-Related Capital Costs - Cost Recovery on Culvert* | $198,711 |
| | | | **Total** | **$6,793,451** |
| *Proportionate Share* | Growth in Developed Acres within IFFP Horizon* | Percent Impervious** | Growth in Impervious Acres within IFFP Horizon | Proportionate Share |
| Single Family Residential | 563 | 35% | 197 | 56.85% |
| Multifamily Residential | 89 | 60% | 53 | 15.37% |
| Commercial | 46 | 90% | 41 | 11.84% |
| Office | 18 | 75% | 14 | 3.89% |
| Industrial | 70 | 60% | 42 | 12.05% |
| **Total** | 785 | | 347 | 100.00% |
| *Capital Cost per Acre**** | | | | |
| Single Family Residential | $6,859 | | | |
| Multifamily Residential | $11,759 | | | |
| Commercial | $17,639 | | | |
| Office | $14,699 | | | |
| Industrial | $11,759 | | | |

*Land use area calculated by TischlerBise using average density and floor area ratios.
**Impervious factors based on *Salt Lake City Hydrology Manual* (1993) and the City's *Storm Drainage Master Plan* (2014)
***For each type of development, the level of service standard (expressed in 'terms of capital cost per acre) is equal to the capital cost multiplied by the proportionate share factor, divided by the acreage to be developed.

## STORM DRAINAGE IMPACT FEES

Input variables for the storm drainage impact fees are shown in the upper section of Figure 47. Fees are derived using the level-of-service standards shown in the middle of the figure (capital cost per acre). For the purposes of the cash flow analysis contained in the separate Impact Fee Facility Plan, the capital cost per acre is converted to a "prototype" amount per housing unit for residential development. As mentioned above, it is assumed nonresidential development will be charged on a 1,000 square feet basis to better reflect intensity of use. Conversions are based on the average density and floor area ratio assumptions shown at the top of the figure.

**Figure 47. Storm Drainage Impact Fees**

| | | | |
|---|---|---|---|
| ***Gross Acreage per Housing Unit*** | *Standards:* | | |
| Single Family | 0.217 | | |
| Multifamily | 0.080 | | |
| ***Nonresidential Floor Area Ratio*** | | | |
| Commercial | 0.25 | | |
| Office | 0.33 | | |
| Industrial | 0.18 | | |
| ***Maximum Supportable Impact Fee Per Acre*** | | | |
| Capital Cost Per Acre | | Current Cost | Increase/(Decrease) |
| Single Family | **$6,859** | $6,040 | $819 |
| Multifamily | **$11,759** | $8,054 | $3,705 |
| Commercial | **$17,639** | $19,128 | ($1,489) |
| Office | **$14,699** | $15,101 | ($402) |
| Industrial | **$11,759** | $12,081 | ($322) |

***Prototype Impact Fee for Use in Cash Flow Analysis***

| | |
|---|---|
| Residential | Per Housing Unit |
| Single Family | $1,491 |
| Multifamily | $941 |
| Nonresidential | Per 1,000 Sq. Feet of Floor Area |
| Commercial | $1,620 |
| Office | $1,023 |
| Industrial | $1,500 |

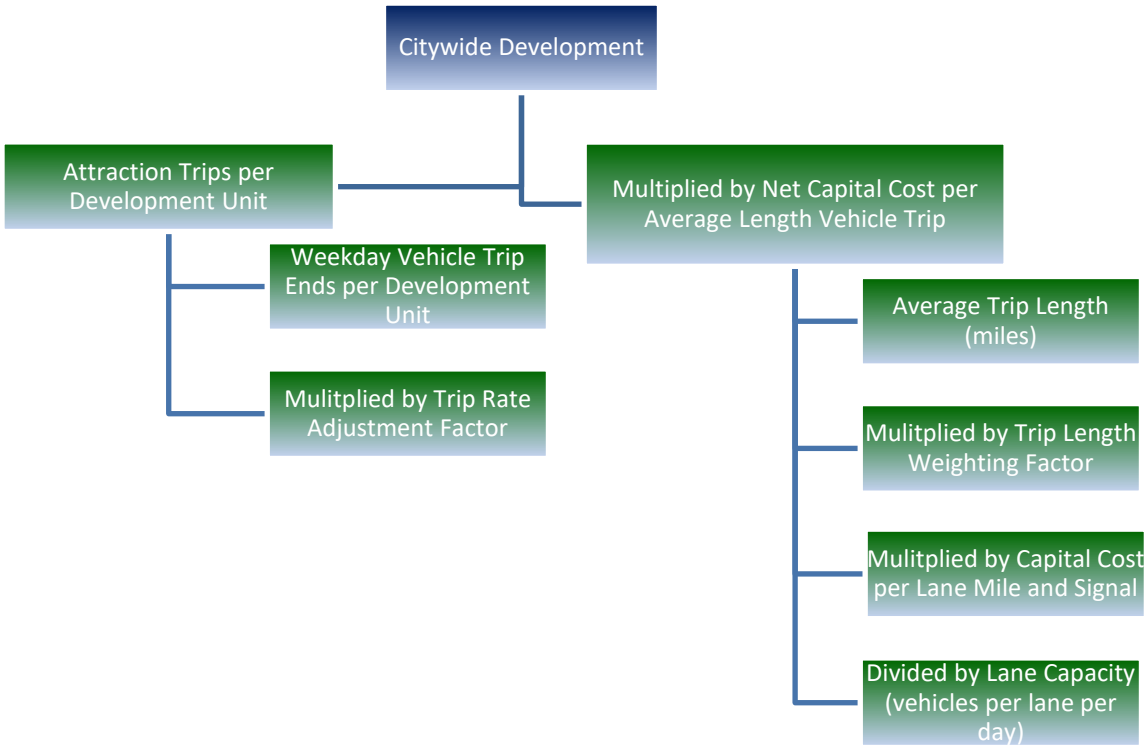
* Fee calculated at the time building permits are issued, based on capital cost per acre by type of development, less principal payment for each connection to the pressure irrigation system.

# Transportation

## METHODOLOGY

The West Jordan road impact fee is a plan-based approach based on the City's *Transportation Master Plan* and capital improvement plan. As shown in Figure 48, the transportation impact fee is derived from trip generation rates, trip rate adjustment factors and the net capacity cost per average length vehicle trip. The cost per vehicle trip is a function of the average trip length, trip-length weighting factor, costs per lane mile, lane capacity, and cost per signalized intersection.

**Figure 48. Road Impact Fee Formula**




## EXISTING LEVELS OF SERVICE FOR TRANSPORTATION

Level of service for transportation impact fees calls for describing and measuring the level of travel delay experienced by vehicles. LOS ranges from free-flow traffic conditions (LOS A) to extremely congested travel (LOS F). Because traffic and overall travel is generally most congested at morning and afternoon peak periods, typical practice generally allows for some driver discomfort during these peak periods while providing better LOS throughout the remainder of the day. According to the City's *Master Transportation Plan*, the City's transportation network presently operates at a minimum of LOS D on arterial and collector streets.

There are currently 7.64 centerline miles of arterial roads and 67.26 centerline miles of collector roads within West Jordan City, for a total of 211.55 lane miles throughout the City, as shown in Figure 49.

**Figure 49. Inventory of City Arterials and Collectors as of June 30, 2015**

| Type | Lanes | Miles | Lane Miles |
|---|---|---|---|
| Major Collectors | 2 | 28.43 | 56.86 |
| Minor Collectors | 3 | 38.83 | 116.49 |
| ***Total Collector Roads*** | | ***67.26*** | ***173.35*** |
| **Type** | **Lanes** | **Miles** | **Lane Miles** |
| Arterials | 5 | 7.64 | 38.20 |
| ***Total Arterial Roads*** | | ***7.64*** | ***38.20*** |
| **Total** | | **74.9** | **211.55** |

Figure 50 shows the calibration of existing development to the current City arterial and collector street network. Using the current arterial and collector lane miles (214.7), TischlerBise determined the weighted-average trip length of 5.20 through a series of spreadsheet iterations. As shown in Figure 50 below, existing development within West Jordan attracted an estimated 1,664,451 Vehicle Miles of Travel (VMT) in 2015, based on the trip generation, trip adjustment, and trip length factors and other assumptions shown in the Figure 52 (discussed in detail following the table). Therefore, the current infrastructure standard is 1.29 lane miles per 10,000 VMT (211.55 lane miles divided by 1,664,451 VMT expressed in ten-thousands). In addition, the City currently owns 31 signalized intersections. The current infrastructure standard for signalized intersections is 0.19 intersections per 1,000 VMT, calculated in the same fashion. The impact fee calculation is based on maintaining these LOS standards with new development and generated trips.

### Figure 50. Existing Level of Service on City Arterial and Collector Network

| | ITE Code | Dev Type | Weekday VTE | Dev Unit | Trip Adj | Trip Length Wt Factor |
|---|---|---|---|---|---|---|
| R1 | 210 | Single Family | 11.00 | HU | 64% | 122% |
| R2 | 220 | Multifamily | 6.50 | HU | 64% | 122% |
| NR1 | 857 | Retail/Restaurant | 42.70 | KSF | 34% | 68% |
| NR2 | 710 | All Other Services | 16.60 | KSF | 50% | 75% |
| NR3 | 140 | Industrial | 3.82 | KSF | 50% | 75% |
| Avg Trip Length (miles) | 5.20 | | | | | |
| Capacity Per Lane | 7,775 | | | | | |
| Signalized Intersections | 31 | | | | | |
| Year-> | *Base* | | | | | |
| ***West Jordan, Utah*** | *2015* | | | | | |
| Single Family HU | 25,382 | | | | | |
| Multifamily HU | 7,840 | | | | | |
| Retail KSF | 3,966 | | | | | |
| Office/Institutional KSF | 2,095 | | | | | |
| Industrial KSF | 4,369 | | | | | |
| *Single Family Trips* | 178,689 | | | | | |
| *Multifamily Trips* | 32,614 | | | | | |
| *Retail/Restaurant Trips* | 57,575 | | | | | |
| *All Other Services Trips* | 17,387 | | | | | |
| *Industrial Trips* | 8,345 | | | | | |
| *Total Vehicle Trips* | 294,611 | | | | | |
| *Vehicle Miles of Travel (VMT)* | 1,644,451 | | | | | |
| LANE MILES | 211.5 | | | | | |
| Lane Miles per 10,000 VMT | 1.29 | | | | | |
| Signalized Intersections | 31.0 | | | | | |
| Annual Intersections | | | | | | |
| Anl Intersection Cost (millions) | | | | | | |
| Signals per 10,000 VMT | 0.19 | | | | | |

## TRIP GENERATION

West Jordan transportation impact fees are based on average weekday vehicle trip ends. Trip generation rates are from the reference book *Trip Generation* published by the Institute of Transportation Engineers (ITE) (ITE 2012). A vehicle trip end represents a vehicle either entering or exiting a development (as if a traffic counter were placed across a driveway). To calculate transportation impact fees, trip generation rates are adjusted to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50%. As discussed further below, the impact fee methodology includes additional adjustments to make the fees proportionate to the infrastructure demanded by particular types of development.

As an alternative to simply using the national average trip generation rate for residential development, the ITE publishes regression curve formulas that may be used to derive custom trip generation rates using local demographic data. Key independent variables needed for the analysis (i.e., vehicles available, housing units, households and persons) are available from the U.S. Census Bureau American Community

Survey (ACS) 2013 data for West Jordan. This data was used to derive custom average weekday vehicle trip ends by type of housing, as shown in Figure 51 below.

### Figure 51. Average Weekday Vehicle Trip Ends by Housing Type in City of West Jordan

| West Jordan, Utah | | Households (2) | | | Vehicles per |
|---|---|---|---|---|---|
| | *Vehicles Available (1)* | *Single Family Units (3)* | *Multifamily Units* | *Total* | *Household by Tenure* |
| Owner-occupied | 55,373 | 22,982 | 565 | 23,547 | 2.35 |
| Renter-occupied | 11,693 | 2,948 | 4,245 | 7,193 | 1.63 |
| TOTAL | 67,066 | 23,547 | 24,112 | 30,740 | 2.18 |
| Housing Units (6) => | | 26,587 | 5,559 | 32,146 | |

| | *Persons (4)* | *Trip Ends (5)* | *Vehicles by Type of Housing* | *Trip Ends (6)* | *Average Trip Ends* | *Trip Ends per Housing Unit* |
|---|---|---|---|---|---|---|
| Single Family Units | 94,292 | 244,011 | 58,837 | 340,113 | 292,062 | **11.0** |
| Multifamily Units | 11,270 | 39,042 | 8,229 | 32,717 | 35,880 | **6.5** |
| TOTAL | 105,562 | 283,053 | 67,066 | 372,830 | 327,942 | **10.2** |

(1) Vehicles available by tenure from Table B25046, American Community Survey, 2013.
(2) Households by tenure and units in structure from Table B25032, American Community Survey, 2013.
(3) Single Family units include detached homes, attached homes and mobile homes.
(4) Persons by units in structure from Table B25033, American Community Survey, 2013.
(5) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.91*LN(persons)+1.52). To approximate the average population of the ITE studies, persons were divided by 169 and the equation result multiplied by 169. For multifamily housing (ITE 220), the fitted curve equation is (3.47*persons)-64.48.
(6) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.99*LN(vehicles)+1.81). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 229 and the equation result multiplied by 229. For multifamily housing (ITE 220), the fitted curve equation is (3.94*vehicles)+293.58.

### *Nonresidential Vehicle Trip Rates*

Vehicle trips rates for nonresidential development are from *Trip Generation* (ITE 2012). The darker shaded and bolded categories in Figure 52 represent the proxy categories for use in determining existing and projected development in West Jordan. The lighter shaded categories represent more specific categories for which fees are also calculated.

### Figure 52. Nonresidential Trip Generation Factors

| *ITE Code* | *Land Use / Size* | *Demand Unit* | *Wkdy Trip Ends Per Demand Unit** |
|---|---|---|---|
| ***Commercial / Shopping Center*** | | | |
| 820 | 10K gross leasable area | 1,000 Sq Ft | 152.03 |
| 820 | 25K gross leasable area | 1,000 Sq Ft | 110.32 |
| 820 | 50K gross leasable area | 1,000 Sq Ft | 86.56 |
| 820 | 100K gross leasable area | 1,000 Sq Ft | 67.91 |
| 820 | 200K gross leasable area | 1,000 Sq Ft | 53.28 |
| **820** | **Average** | **1,000 Sq Ft** | **42.94** |
| 857 | Discount Club | 1,000 Sq Ft | 41.80 |
| ***General Office*** | | | |
| 710 | 10K gross floor area | 1,000 Sq Ft | 22.66 |
| 710 | 25K gross floor area | 1,000 Sq Ft | 18.35 |
| 710 | 50K gross floor area | 1,000 Sq Ft | 15.65 |
| 710 | 100K gross floor area | 1,000 Sq Ft | 13.34 |
| 710 | 200K gross floor area | 1,000 Sq Ft | 11.37 |
| **710** | **Average** | **1,000 Sq Ft** | **11.01** |
| ***Other Nonresidential*** | | | |
| 770 | Business Park*** | 1,000 Sq Ft | 12.76 |
| **760** | **Research & Dev Center** | **1,000 Sq Ft** | **8.11** |
| *610* | *Hospital* | *1,000 Sq Ft* | *16.50* |
| 565 | Day Care | student | 4.48 |
| 550 | University/College | student | 2.38 |
| 530 | High School | student | 1.71 |
| 520 | Elementary School | student | 1.29 |
| 520 | Elementary School | 1,000 Sq Ft | 15.43 |
| *320* | *Motel* | *room* | *5.63* |
| *254* | *Assisted Living* | *bed* | *2.66* |
| 151 | Mini-Warehouse | 1,000 Sq Ft | 2.50 |
| *150* | *Warehousing* | *1,000 Sq Ft* | *3.56* |
| 140 | Manufacturing | 1,000 Sq Ft | 3.82 |
| 110 | Light Industrial | 1,000 Sq Ft | 6.97 |

* Trip Generation, Institute of Transportation Engineers, 2009.

## ADJUSTMENTS FOR COMMUTING PATTERNS AND PASS-BY TRIPS

Residential development in the City has a larger trip adjustment factor of 64 percent to account for commuters leaving West Jordan for work. According to the National Household Travel Survey, home-based work trips are typically 31 percent of "production" trips, in other words, out-bound trips (which are 50 percent of all trip ends). Also, data from the US Census Bureau indicates that 91 percent of West Jordan's workers travel outside the City for work. In combination, these factors (0.31 x 0.50 x 0.91 = 0.14) account for 14 percent of additional production trips. The total adjustment factor for residential includes attraction trips (50 percent of trip ends) plus the journey-to-work commuting adjustment (14 percent of production trips) for a total of 64 percent.

For commercial, the trip adjustment factor is less than 50% because retail development and some services, like day care centers, attract vehicles as they pass by on arterial and collector roads. For example, when someone stops at a convenience store on the way home from work, the convenience store is not

the primary destination. For the average shopping center, the ITE data indicates that 34% of the vehicles that enter are passing by on their way to some other primary destination. The remaining 66% of attraction trips have the commercial site as their primary destination. Because attraction trips are half of all trips, the trip adjustment factor is 66% multiplied by 50%, or approximately 33% of the trip ends. A basic trip adjustment factor of 50 percent is applied to the office and industrial land use categories.

## LANE CAPACITY

Transportation impact fees are based on a lane capacity standard of 7,775 vehicles per lane for a four-lane (not including turn-lane) suburban arterial road operating at a level of service "D."

## TRIP LENGTH WEIGHTING FACTOR BY TYPE OF LAND USE

The transportation impact fee methodology includes a percentage adjustment, or weighting factor, to account for trip length variation by type of land use. As documented in Table 6 of the 2001 National Household Travel Survey (published in 2004 by the Federal Highway Administration), vehicle trips from residential development are approximately 122% of the average trip length. The residential trip length adjustment factor includes data on home-based work trips, social, and recreational purposes. Conversely, shopping trips associated with commercial development are roughly 68% of the average trip length while other nonresidential development typically accounts for trips that are 75% of the average trip length. The specific weighting factors for each development prototype were shown previously in Figure 50.

## GROWTH-RELATED ROAD IMPROVEMENTS

The capacity projects from which the transportation impact fees are derived are shown below in Figure 53. There are three project components. The top part of figure indicates projects eligible through the impact fee calculation. These projects are capacity improvements constructed by developers for which the City has agreed to reimburse the developer through future impact fees. These improvements total $761,902.

The middle portion of the figure shoes planned road capacity expansion projects eligible for the impact fee calculation. These projects represent eight lane miles identified as growth-related that the City plans to construct within the next six years (the IFFP horizon). These improvements total $11.3 million (not including grants and other sources) based on estimates provided by the West Jordan City Public Works Department. The growth share of these projects is estimated at $6,066,760, based on modeling prepared as part of the *Transportation Master Plan* and the City's capital improvement planning process.

The bottom portion of Figure 53 indicates growth-related signalized intersection improvements the City plans to construct over the next six years. These include seven intersection improvements projects. These improvements total $2,431,412 and are 100 percent attributable to growth.

To determine the total cost per demand unit, the total growth-related costs of $9,260,074 are divided by the net increase in VMT from 2015 to 2021 (182,871) to determine a cost per VMT of $50.64.

### Figure 53. Impact Fee-Eligible Road and Intersection Projects

| Developer | Project Name | Road Name | Lane Miles | Total Project Cost | Growth Share | Growth Cost |
|---|---|---|---|---|---|---|
| DR Horton | Copperfield | 9000 South | 1.93 | $310,031.45 | 100% | $310,031 |
| LDS Church | Copperview 90th So. | 9000 South | 0.28 | $30,180.69 | 100% | $30,181 |
| Ivory | Bloomfield Farms | 5600 West | 0.98 | $90,806.97 | 100% | $90,807 |
| McArthur Homes | Amberly Condos | 7000 South | 0.18 | $12,702.00 | 100% | $12,702 |
| Ivory | Bloomfield Heights | 6400 W, 8200 S | 3.20 | $318,180.77 | 100% | $318,181 |
| | | ***Total*** | ***6.57*** | ***$761,901.88*** | | ***$761,902*** |
| | | | | | Increase in VMT from 2015 to 2021 | 182,871 |
| | | | | | Capital Cost per VMT | **$4.17** |

| Expenditure Year | Project # | Project | Location | Segment Length (miles) | Added Lane Miles | Total Project Cost for City | Growth Share | Growth Cost |
|---|---|---|---|---|---|---|---|---|
| FY 16-19 | 1 | 7800 S | 40-48 W | 1 | 2 | $2,936,315 | 52% | $1,526,884 |
| FY 16 | 33 | 8600 South | 5600 West to 6000 West (no bridge) | 1 | 2 | $750,000 | 75% | $562,500 |
| FY 16 | - | 7800 S | 13W to U-111 | 1 | 2 | $3,900,000 | 52% | $2,028,000 |
| FY 17-20 | 3 | 7800 S | 5900 W to 6700 W | 1 | 2 | $3,748,800 | 52% | $1,949,376 |
| | | | ***Total*** | ***4*** | ***8*** | ***$11,335,115*** | | ***$6,066,760*** |
| | | | | | | | Increase in VMT from 2015 to 2021 | 182,871 |
| | | | | | | | Capital Cost per VMT | **$33.18** |

| Expenditure Year | Project # | Project | Total Cost | Growth Share | Growth Cost |
|---|---|---|---|---|---|
| FY16-17 | - | Traffic signal installation | $664,853 | 100% | $664,853 |
| FY16-17 | 14 | 7000 S Railroad crossing (construction) | $791,559 | 100% | $791,559 |
| FY17-18 | - | Traffic signal installation | $175,000 | 100% | $175,000 |
| FY18-19 | - | Traffic signal installation | $200,000 | 100% | $200,000 |
| FY19-20 | - | Traffic signal installation | $200,000 | 100% | $200,000 |
| FY20-21 | - | Traffic signal installation | $200,000 | 100% | $200,000 |
| FY21-22 | - | Traffic signal installation | $200,000 | 100% | $200,000 |
| | | ***Total*** | ***$2,431,412*** | | ***$2,431,412*** |
| | | | | Increase in VMT from 2015 to 2021 | 182,871 |
| | | | | Capital Cost per VMT | **$13.30** |

## PROJECTED TRAVEL DEMAND

The relationship between the amount of current and future development in West Jordan and planned system improvements is documented in Figure 54. In the table below HU means housing units, KSF means square feet of nonresidential development, in thousands, and the Institute of Transportation Engineers is abbreviated ITE.

Projected development in West Jordan over the next six years, and the corresponding need for additional lane miles, is shown in the middle section of Figure 54. Trip generation rates and trip adjustment factors convert projected development into average weekday vehicle trips. A typical vehicle trip, such as a person leaving their home and traveling to work, generally begins on a local street that connects to a collector street, which connects to an arterial road and eventually to a state or interstate highway. This progression of travel up and down the functional classification chain limits the average trip length question to the following, “What is the average vehicle trip length on impact fee system improvements (i.e., major roads listed in the IFFP)?”

As shown in Figure 54 below, new development increases average weekday vehicle trips on arterials and collectors from 294,611 in 2015 to 327,850 in 2021, for a net increase of 33,239 trips. In terms of VMT, new development generates an additional 182,871 VMT. When VMT is compared to the current infrastructure LOS standards discussed previously (see Figure 50), new development generates the need for an additional 23.5 lane miles of City-owned roads and 3.4 City-owned signalized intersections.

### Figure 54. Projected Travel Demand and Road Needs

| | *ITE Code* | *Dev Type* | *Weekday VTE* | *Dev Unit* | *Trip Adj* | *Trip Length Wt Factor* |
|---|---|---|---|---|---|---|
| R1 | 210 | Single Family | 11.00 | HU | 64% | 122% |
| R2 | 220 | Multifamily | 6.50 | HU | 64% | 122% |
| NR1 | 857 | Retail/Restaurant | 42.70 | KSF | 34% | 68% |
| NR2 | 710 | All Other Services | 16.60 | KSF | 50% | 75% |
| NR3 | 140 | Industrial | 3.82 | KSF | 50% | 75% |
| Avg Trip Length (miles) | **5.20** | | | | | |
| Capacity Per Lane | **7,775** | | | | | |
| Signalized Intersections | **31** | | | | | |

| Year-> | *Base* | *1* | *2* | *3* | *4* | *5* | *6* | *6-Year* |
|---|---|---|---|---|---|---|---|---|
| ***West Jordan, Utah*** | *2015* | *2016* | *2017* | *2018* | *2019* | *2020* | *2021* | *Increase* |
| Single Family HU | 25,382 | 25,802 | 26,222 | 26,642 | 27,062 | 27,482 | 27,972 | 2,590 |
| Multifamily HU | 7,840 | 8,020 | 8,200 | 8,380 | 8,560 | 8,740 | 8,950 | 1,110 |
| Retail KSF | 3,966 | 4,048 | 4,131 | 4,213 | 4,295 | 4,378 | 4,460 | 494 |
| Office/Institutional KSF | 2,095 | 2,138 | 2,182 | 2,225 | 2,269 | 2,312 | 2,356 | 261 |
| Industrial KSF | 4,369 | 4,460 | 4,551 | 4,642 | 4,733 | 4,823 | 4,914 | 545 |
| *Single Family Trips* | 178,689 | 181,646 | 184,603 | 187,560 | 190,517 | 193,474 | 196,924 | |
| *Multifamily Trips* | 32,614 | 33,363 | 34,112 | 34,861 | 35,610 | 36,359 | 37,232 | |
| *Retail/Resturant Trips* | 57,575 | 58,771 | 59,968 | 61,164 | 62,360 | 63,557 | 64,753 | |
| *All Other Services Trips* | 17,387 | 17,748 | 18,109 | 18,470 | 18,832 | 19,193 | 19,554 | |
| *Industrial Trips* | 8,345 | 8,519 | 8,692 | 8,866 | 9,039 | 9,213 | 9,386 | |
| *Total Vehicle Trips* | 294,611 | 300,048 | 305,485 | 310,921 | 316,358 | 321,795 | 327,850 | 33,239 |
| *Vehicle Miles of Travel (VMT)* | 1,644,451 | 1,674,277 | 1,704,102 | 1,733,928 | 1,763,753 | 1,793,579 | 1,827,322 | 182,871 |
| LANE MILES | **211.5** | 215.3 | 219.2 | 223.0 | 226.8 | 230.7 | 235.0 | 23.5 |
| ANL LN MI | | 3.8 | 3.9 | 3.8 | 3.8 | 3.9 | 4.3 | |
| Lane Miles per 10,000 VMT | 1.29 | 1.29 | 1.29 | 1.29 | 1.29 | 1.29 | 1.29 | |
| Signalized Intersections | **31.0** | 31.6 | 32.1 | 32.7 | 33.2 | 33.8 | 34.4 | 3.4 |
| Annual Intersections | | 0.6 | 0.5 | 0.6 | 0.5 | 0.6 | 0.6 | |
| Anl Intersection Cost (millions) | | $0.21 | $0.17 | $0.21 | $0.17 | $0.21 | $0.21 | $1.18 |
| Signals per 10,000 VMT | **0.19** | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | |

## REVENUE CREDIT EVALUATION

A credit for future gas taxes is only necessary if there is potential double payment for system improvements. In West Jordan City, gas tax revenue will be used for maintenance of existing facilities, correcting existing deficiencies, and for capital projects that are not impact fee system improvements. Therefore, there is no potential double payment from other revenues because road impact fees will exclusively fund system improvements.

## TRANSPORTATION IMPACT FEES

Input variables for the transportation impact fee are shown in the upper section of Figure 55. Attraction trips by type of development are multiplied by the cost per VMT to yield the transportation impact fees. The cost per VMT is multiplied by the weekday average number of trips per unit multiplied by the trip rate adjustment factor to determine the adjusted trip rate. This figure is then multiplied by the average trip

length and the corresponding trip length weighting factor by land use as described above to determine VMT. Finally, VMT is multiplied by the capital cost per VMT to yield the fee. For example, to derive the transportation impact fee for a multifamily housing unit the trip rate of 6.5 is multiplied by 64% (the adjustment factor), resulting in 4.2 adjusted trips. The adjusted trip rate of 4.2 is multiplied by the average trip length of 5.20, yielding a trip length of = 21.84 miles. The 21.84 mile length is then multiplied by the trip length weighting factor of 122% for an adjusted vehicle miles of travel of 26.65 (unrounded) miles. This factor is multiplied by the cost per VMT ($50.64) for an impact fee amount of $1,336 (truncated) per unit. Fees for nonresidential development are listed per 1,000 square feet of floor area.

### Figure 55. Transportation Impact Fees

| Fee Component | Cost per VMT |
|---|---|
| Arterial Improvements | $33.18 |
| Developer Reimbursements | $4.17 |
| Signalized Intersections | $13.30 |
| *Total* | *$50.64* |
| Average Miles per Vehicle Trip | 5.20 |

***Residential (per Housing Unit)***

| *ITE Code* | *Unit Type* | *Weekday Vehicle Trip Ends (per unit)* | *Trip Rate Adjustment Factors* | *Trip Length Weighting Factors* | ***Proposed Road Impact Fee*** | ***Current Fee*** | ***Increase/ (Decrease)*** |
|---|---|---|---|---|---|---|---|
| 210 | Single Family | 11.0 | 64% | 122% | **$2,261** | $3,577 | ($1,316) |
| 220 | Multifamily | 6.5 | 64% | 122% | **$1,336** | $1,742 | ($406) |

***Nonresidential (per 1,000 Sq Ft of floor area)***

| *ITE Code* | *Development Type* | *Weekday Vehicle Trip Ends (per unit)* | *Trip Rate Adjustment Factors* | *Trip Length Weighting Factors* | ***Proposed Road Impact Fee*** | ***Current Fee*** | ***Increase/ (Decrease)*** |
|---|---|---|---|---|---|---|---|
| 820 | Commercial | 42.70 | 34% | 68% | **$2,599** | $4,163 | ($1,564) |
| 710 | Office | 16.60 | 50% | 75% | **$1,639** | $1,784 | ($145) |
| 760 | Industrial | 3.82 | 50% | 75% | **$377** | $1,314 | ($937) |
| 150 | Warehousing | 3.56 | 50% | 75% | **$351** | - | - |
| 610 | Hospital | 13.22 | 50% | 75% | **$1,305** | - | - |
| 620 | Nursing Home | 7.60 | 50% | 75% | **$750** | - | - |

| *ITE Code* | *Development Type* | *Trips per Bed* | *Trip Rate Adjustment Factors* | *Trip Length Weighting Factors* | ***Proposed Road Impact Fee*** | ***Current Fee*** | ***Increase / (Decrease)*** |
|---|---|---|---|---|---|---|---|
| 254 | Assisted Living | 2.66 | 50% | 75% | **$262** | - | - |

| *ITE Code* | *Development Type* | *Trips per Room* | *Trip Rate Adjustment Factors* | *Trip Length Weighting Factors* | ***Proposed Road Impact Fee*** | ***Current Fee*** | ***Increase / (Decrease)*** |
|---|---|---|---|---|---|---|---|
| 320 | Motel | 5.63 | 50% | 75% | **$555** | - | - |

## Proportionate Share Analysis

Impact fees for West Jordan are proportionate and reasonably related to the capital facility service demands of new development. The written analysis of each impact fee methodology and the cash flow analysis have established that impact fees are necessary to achieve an equitable allocation of the costs, borne in the past and to be borne in the future, in comparison to the benefits already received and yet to be received.

The Impact Fees Act includes the seven evaluation factors set forth in the Utah Supreme Court decision known as ***Banberry Development Corp. v. South Jordan City***. The analysis of these seven factors is discussed below.

1) The impact fees for West Jordan are based on the cost of existing public facilities. Impact fees may include cost recovery components that were derived from the actual construction costs of specific capital improvements by West Jordan City. Impact fees are also based on Capital Facilities Plans that were prepared using local cost factors and construction practices typical to West Jordan City. These Capital Facilities Plans are based on engineering studies that have been incorporated into West Jordan's General Plan. The parks section contains an inventory of existing facilities and the cost of improvements. This inventory of existing facilities was used to derive level of service standards. These standards were then used to project the need for future park improvements.

2) The impact fee analysis has considered the funding of public facilities, including user charges, bonds, General Fund taxes, and intergovernmental transfers. If applicable, these revenue sources are shown in the cash flow analysis for each type of impact fee.

3) The extent to which vacant properties in the municipality may contribute to the cost of existing public facilities has been evaluated. A revenue credit for Fire infrastructure is provided in the impact fee methodologies.

4) The relative extent to which properties will make future contributions to the cost of existing public facilities has also been addressed in principal payment credits included in the impact fee calculations.

5) West Jordan City will evaluate the extent to which newly developed properties are entitled to a credit for common facilities that have been provided by owners or developers as compared to common facilities provided by the City in other parts of the municipality. These "site-specific" credits will be available for system improvements identified in the Capital Facilities Plans.

6) Citywide service areas are appropriate for the types of public facilities included in the impact fees study. Extraordinary costs, if any, in servicing newly developed properties will be addressed through administrative procedures that allow independent studies to be submitted to the City.

7) The time-price differential inherent in fair comparisons of amounts paid at different times has been addressed in the evaluation of credits for future principal payments. All costs in the impact fee calculations are given in current dollars with no assumed inflation rate over time. Necessary cost adjustments can be made as part of the periodic evaluation and update of impact fees.

## Implementation and Administration

Along with the required annual report, impact fees should be evaluated and updated to reflect recent data. One approach is to adjust for inflation in construction costs by means of an index like the one published by Engineering News Record (ENR). This index can be applied against the calculated impact fee. If cost estimates change significantly, the City should recalculate the fees. Another possible change in calculation will occur if the City bond-finances infrastructure that receives impact fee funding.

As specified in the Impact Fees Act, there are certain accounting requirements that will be met by West Jordan City. Impact fees must be deposited in separate interest bearing ledger accounts. Fees should be spent within six years of when they are collected, with the expenditures limited to system improvements identified in the CFP.

# Appendix A – Demographic Data

As part of our Work Scope, TischlerBise prepared documentation on demographic data and development projections that will be used in the Impact Fee Study. The demographic data estimates for July 1, 2015, will be used in the study calculations. The development projections are used solely for the purpose of having an understanding of the possible future pace of service demands, impact fee revenues, and capital expenditures. The data herein are for City of West Jordan Water, Wastewater, Storm Drainage, Roads, Parks, Police, and Fire impact fees.

Calculations throughout this technical memo are based on analysis conducted using Excel software. Results are discussed in the memo using one-and two-digit places (in most cases), which represent rounded figures. However, the analysis itself uses figures carried to their ultimate decimal places; therefore the sums and products generated in the analysis may not equal the sum or product if the reader replicates the calculation with the factors shown in the report (due to the rounding of figures shown, not in the analysis).

## POPULATION AND HOUSING CHARACTERISTICS

According to the U.S. Census Bureau, a household is a housing unit that is occupied by year-round residents. Impact fees often use per capita standards and persons per housing unit or persons per household to derive proportionate-share fee amounts. When persons per housing unit are used in the fee calculations, infrastructure standards are derived using year-round population. When persons per household are used in the fee calculations, the impact fee methodology assumes all housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards. TischlerBise recommends that impact fees for residential development in the City of West Jordan be imposed according to the number of year-round residents per housing unit.

As shown in the bottom portion of Figure A1, in 2013, dwellings with a single unit per structure (detached, attached, and mobile homes) averaged 3.55 persons per unit. Dwellings in structures with multiple units averaged 2.03 year-round residents per unit.

**Figure A1. City of West Jordan Persons per Housing Unit**

West Jordan Population and Housing Characteristics in 2013

| *Units in Structure* | *Renter & Owner* | | | *Housing Units* | *Persons Per Hsg Unit* | *Vacancy Rate* |
|---|---|---|---|---|---|---|
| | Persons | Households | | | | |
| Single Family | 91,740 | 25,217 | 3.64 | 25,874 | 3.55 | 2.5% |
| Mobile Homes | 2,552 | 713 | 3.58 | 713 | 3.58 | 0.0% |
| 2+ Units | 11,270 | 4,810 | 2.34 | 5,559 | 2.03 | 13.5% |
| Total | 105,562 | 30,740 | 3.43 | 32,146 | | |
| | | | Vacant/Seasonal HU | 1,406 | | |

| ***2013 Summary by Type of Housing*** | *Persons* | *House-holds* | *Persons per Household* | *Housing Units* | *Persons Per Hsg Unit* | *Housing Mix* |
|---|---|---|---|---|---|---|
| Single Family | 94,292 | 25,930 | 3.64 | 26,587 | **3.55** | 83% |
| Multifamily | 11,270 | 4,810 | 2.34 | 5,559 | **2.03** | 17% |
| Subtotal | 105,562 | 30,740 | 3.43 | 32,146 | **3.28** | *Vacancy Rate* |
| Group Quarters | 556 | | | | | |
| TOTAL | 106,118 | 30,740 | | 32,146 | | 4.4% |

*Source: 2009-2013 American Community Survey 5-year Estimates, U.S. Census Bureau*

## RECENT RESIDENTIAL CONSTRUCTION

From 2000 to 2010, West Jordan increased by an average of 1,177 housing units per year. The chart at the bottom of Figure A2 indicates the estimated number of housing units added by decade in West Jordan. Housing units constructed per decade steadily increased from the 1970s to the 2000s, but construction may have slowed in the 2010s following the Great Recession. In fact, from 2010 to 2015 West Jordan added an average of only 327 housing units per year (Figure A3).

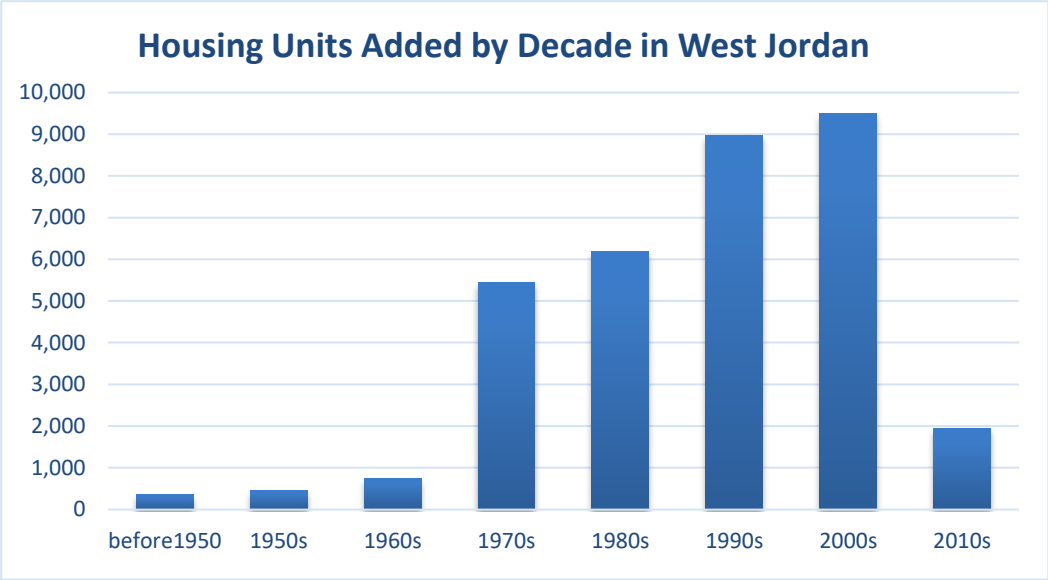
**Figure A2. Housing Units by Decade**

City of West Jordan, UT

| | |
|---|---|
| US Census Bureau Population in 2010* | 103,712 |
| Housing Units in 2010* | 31,366 |
| Total Housing Units in 2000 | 19,597 |
| *New Housing Units* | 11,769 |

From 2000 to 2010, West Jordan added an average of 1,177 housing units per year. From 2010 to 2015, the City added an average of 327 units per year.

**2010 Census Summary*
*Table H1 from 2000 Census 100% Count data*




*Source for 1990s and earlier is Table B25034, American Community Survey, 2010.*
*Source for 2000s is U.S. Census Bureau*
*Source for 2010s is Department of Community Development permitting data*

**Figure A3. Housing Permitting from 2000-2015**

| Year | Single Family | Multifamily | Total |
|---|---|---|---|
| 2001 | 386 | 193 | 579 |
| 2002 | 666 | 439 | 1,105 |
| 2003 | 1,221 | 655 | 1,876 |
| 2004 | 826 | 252 | 1,078 |
| 2005 | 860 | 152 | 1,012 |
| 2006 | 532 | 114 | 646 |
| 2007 | 162 | 426 | 588 |
| 2008 | 87 | 125 | 212 |
| 2009 | 141 | 414 | 555 |
| 2010 | 150 | 318 | 468 |
| 2011 | 148 | 90 | 238 |
| 2012 | 235 | 60 | 295 |
| 2013 | 177 | 52 | 229 |
| 2014 | 179 | 72 | 251 |
| 2015 | 126 | 333 | 459 |
| *Total* | 5,896 | 3,695 | 9,591 |

*Source: Department of Development, City of West Jordan, UT*

*From 2001 to 2010, West Jordan added an average of 503 single family units and 309 multifamily housing units per year according to City building permit data.*

*From 2010 to 2015, West Jordan added an average of 192 single family units and 135 multifamily housing units per year according to City building permit data.*

### *Current Estimate of Housing Units and Households*

There were 31,898 housing units in West Jordan on July 1, 2011. Using building permit information for residential development from July 1, 2011 to June 30, 2015, TischlerBise estimates the number of housing units for July 1, 2015 is 33,222.

**Figure A4. July 1, 2015, Estimate of Housing Units in the City of West Jordan**

| | | Building Permits Issued [2] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *July 1, 2011 Units [1]* | *2011 (July 1-Dec 31)* | *2012 (Jan 1-Dec 31)* | *2013 (Jan 1-Dec 31)* | *2014 (Jan 1-Dec 31)* | *2015 (Jan 1-June 30)* | *Total Units Added* | *Estimated July 2015 Units [3]* |
| Single Family | 24,587 | 78 | 235 | 177 | 179 | 126 | 795 | 25,382 |
| Multifamily | 7,311 | 12 | 60 | 52 | 72 | 333 | 529 | 7,840 |
| *Totals* | *31,898* | 90 | 295 | *229* | *251* | *459* | *1324* | ***33,222*** |

*[1] TischlerBise 2013 Impact Fee Study for West Jordan, Utah*
*[2] City of West Jordan*
*[3] US 2010 Census units plus permitted units added.*

### *Current Estimate of Population*

TischlerBise estimates the City's current population at 106,021. This estimate is based on the number and type of residential permits issued for new construction since July 1, 2011 and persons per housing unit by type of housing unit. Detail is provided below in Figure A5.

**Figure A5. July 1, 2015, Estimate of Population in the City of West Jordan**

| | Estimated July 2015 Units [1] | Persons Per Hsg Unit[2] | Estimated July 2015 Population |
|---|---|---|---|
| Single Family | 25,382 | 3.55 | 90,106 |
| Multifamily | 7,840 | 2.03 | 15,915 |
| *Totals* | 33,222 | | ***106,021*** |

*[1] See Figure A3*
*[2] 2009-2013 American Community Survey 5-Year Estimates, U.S. Census Bureau.*

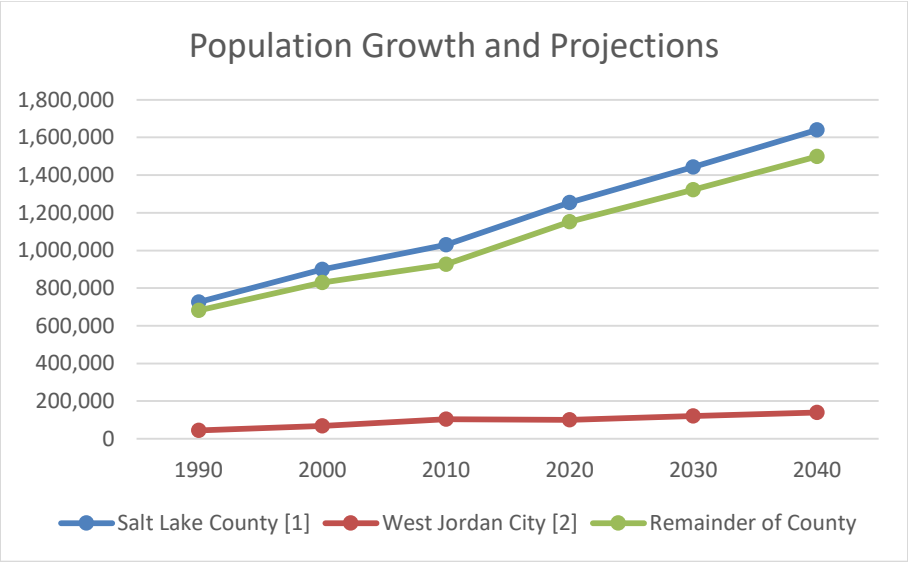
## HOUSING UNIT AND POPULATION PROJECTIONS

To provide context for population growth in West Jordan, TischlerBise prepared a comparison to Salt Lake County projections. The Wasatch Front Region Small Area Socioeconomic Forecasts projects the presence of 1,442,988 persons in Salt Lake County by 2030. Figure A6 indicates the City's share of countywide population over time. The City population projections for 2020 and 2030 are interpolated using a steady growth rate derived from the 2010 Census population count and Wasatch Front Regional Council projections through 2040.

**Figure A6. City of West Jordan Population Share**

| | 1990 | 2000 | 2010 | 2020 | 2030 | 2040 |
|---|---|---|---|---|---|---|
| Salt Lake County [1] | 725,956 | 898,387 | 1,029,655 | 1,253,395 | 1,442,988 | 1,639,550 |
| West Jordan City [2] | 44,892 | 68,336 | 103,712 | 126,600 | 146,243 | 165,885 |
| Remainder of County | 681,064 | 830,051 | 925,943 | 1,126,795 | 1,296,745 | 1,473,665 |
| West Jordan Share | 6.2% | 7.6% | 10.1% | 10.1% | 10.1% | 10.1% |

*Sources: [1] Salt Lake County 1990 - 2010 from U.S. Census Bureau, 2020 - 2030 projections from Table 1, Wasatch Front Region Small Area Socioeconomic Forecasts: 2007 - 2040 (released 2010). [2] City of West Jordan 1990 - 2010 from U.S. Census Bureau; 2020 - 2030 projections from Wasatch Front Region 2011-2040 Regional Transportation Plan*




Using these population projections, TischlerBise calculated future housing unit growth at a rate of 848 units per year. However, as shown above in Figure A3, since 2010 the City has permitted an average of

only 327 units per year, suggesting the local market has not rebounded to pre-recession levels of construction. Nevertheless, the market seems to be improving: January to June 2015 permitting totaled 337 units, indicating a more advanced recovery in the market. With these trends in mind and in conjunction with deliberations with City officials, TischlerBise projected an average annual increase of 600 units for the next five years. In 2021, average annual growth in housing units increases to 700, reflecting the City's large portion of the undeveloped land in the greater Salt Lake region.

Population increases are dependent upon housing mix, or the share of multifamily and single family units in a market. Residential permit data indicates that from 2003 to 2009, 64% of permitted units were single family, whereas from 2010 to 2015 only 52% were single-family. However, despite this increase in the share of multifamily housing permitted following the Great Recession, the City's new Cap and Grade guidelines limiting multifamily development suggests that the multifamily share of new permitted units will decrease in the future. As a result, new housing units were allocated as 70% single family units and 30% multifamily units (Figure A7).

**Figure A7. City of West Jordan Annual Residential Development Projections**

| | | | | | | | ~~~Five-Yr Increments | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2030 | 2035 | 2040 |
| ***Cumulative*** | | *Base Yr* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *15* | *20* | |
| ***Housing Unit Projections*** | *PPHU* | | | | | | | | | | | | | | |
| Single Family Units | *3.55* | 25,382 | 25,802 | 26,222 | 26,642 | 27,062 | 27,482 | 27,972 | 28,462 | 28,952 | 29,442 | 29,932 | 32,382 | 34,833 | 37,283 |
| Multifamily Units | *2.03* | 7,840 | 8,020 | 8,200 | 8,380 | 8,560 | 8,740 | 8,950 | 9,160 | 9,370 | 9,580 | 9,790 | 10,840 | 11,890 | 12,940 |
| Total Housing Units | | 33,222 | 33,822 | 34,422 | 35,022 | 35,622 | 36,222 | 36,922 | 37,622 | 38,322 | 39,022 | 39,722 | 43,223 | 46,723 | 50,223 |
| *Annual Net Increase in Housing Units* | | | *600* | *600* | *600* | *600* | *600* | *700* | *700* | *700* | *700* | *700* | *700* | *700* | *700* |
| ***Population Projections*** | | | | | | | | | | | | | | | |
| Population | | 106,021 | 107,878 | 109,734 | 111,591 | 113,447 | 115,304 | 117,470 | 119,636 | 121,802 | 123,968 | 126,134 | 136,963 | 147,793 | 158,623 |
| *Annual Net Increase in Population* | | | *1,857* | *1,857* | *1,857* | *1,857* | *1,857* | *2,166* | *2,166* | *2,166* | *2,166* | *2,166* | *2,166* | *2,166* | *2,166* |

## NONRESIDENTIAL DEVELOPMENT ESTIMATES AND PROJECTIONS

In addition to data on residential development, the calculation of impact fees requires data on nonresidential development. TischlerBise uses the term "jobs" to refer to employment by place of work. To convert jobs to floor area of nonresidential development, TischlerBise uses average square feet per employee multipliers, shown in Figure A8. The employee to building area ratios are derived using national data published by the Institute of Transportation Engineers (ITE) and the Urban Land Institute (ULI). In the impact fee study, vehicle trips per demand unit (i.e., one thousand square feet of floor area, beds, students, or rooms) will be used to differentiate fees by type of nonresidential development. In the table below, gray shading indicates three nonresidential development prototypes used by TischlerBise to calculate vehicle trips and potential impact fee revenue. The prototype for retail and/or general restaurant jobs is an average-size shopping center. The prototype for industrial jobs is manufacturing. For all other office uses/services, the prototype is an average sized general office building.

**Figure A8. Employee and Building Area Ratios**

| ITE Code | Land Use / Size | Demand Unit | Wkdy Trip Ends Per Dmd Unit* | Wkdy Trip Ends Per Employee* | Emp Per Dmd Unit | Sq Ft Per Emp |
|---|---|---|---|---|---|---|
| 110 | Light Industrial | 1,000 Sq Ft | 6.97 | 3.02 | 2.31 | 433 |
| 130 | Industrial Park | 1,000 Sq Ft | 6.83 | 3.34 | 2.04 | 489 |
| 140 | Manufacturing | 1,000 Sq Ft | 3.82 | 2.13 | 1.79 | 558 |
| 150 | Warehousing | 1,000 Sq Ft | 3.56 | 3.89 | 0.92 | 1,093 |
| 254 | Assisted Living | bed | 2.66 | 3.93 | 0.68 | na |
| 320 | Motel | room | 5.63 | 12.81 | 0.44 | na |
| 520 | Elementary School | 1,000 Sq Ft | 15.43 | 15.71 | 0.98 | 1,018 |
| 530 | High School | 1,000 Sq Ft | 12.89 | 19.74 | 0.65 | 1,531 |
| 540 | Community College | student | 1.23 | 15.55 | 0.08 | na |
| 550 | University/College | student | 1.71 | 8.96 | 0.19 | na |
| 565 | Day Care | student | 4.38 | 26.73 | 0.16 | na |
| 610 | Hospital | 1,000 Sq Ft | 13.22 | 4.50 | 2.94 | 340 |
| 620 | Nursing Home | 1,000 Sq Ft | 7.60 | 3.26 | 2.33 | 429 |
| 710 | General Office (avg size) | 1,000 Sq Ft | 11.03 | 3.32 | 3.32 | 301 |
| 760 | Research & Dev Center | 1,000 Sq Ft | 8.11 | 2.77 | 2.93 | 342 |
| 770 | Business Park | 1,000 Sq Ft | 12.44 | 4.04 | 3.08 | 325 |
| 820 | Shopping Center (avg size) | 1,000 Sq Ft | 42.70 | na | 2.00 | 500 |
| 710 | Office** | 1,000 Sq Ft | 16.60 | 3.32 | 5.00 | 200 |

** Trip Generation, Institute of Transportation Engineers, 9th Edition (2012).*

*** Employees per SF from edcUTAH (Economic Development Corporation of Utah), Gardner Company, and Simons REALTORS.*

Similar to the population share evaluation discussed above, countywide job projections are shown in Figure A9 along with City of West Jordan's share. Salt Lake County and City of West Jordan jobs in 2000 are from the Census Transportation Package (CTPP). County and City data for 2005 through 2012 are from OnTheMap, the U.S. Census Bureau's web application, which provides employment estimates at the place level to analyze commuting patterns. 2015 and 2040 county job data are from the Wasatch Front Regional Council's 2015-2040 Regional Transportation Plan and the Utah Department of Workforce Services. West Jordan job shares for those years are interpolated using a simple growth rate formula.

**Figure A9. City of West Jordan Job Share**

| | 2002 | 2004 | 2006 | 2008 | 2010 | 2012 | 2015 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Salt Lake County [1] | 519,446 | 517,164 | 555,952 | 584,905 | 558,519 | 580,945 | 655,896 | 996,611 |
| West Jordan [2] | 19,482 | 22,529 | 25,694 | 29,214 | 24,302 | 25,427 | 26,236 | 39,864 |
| Remainder of County | 499,964 | 494,635 | 530,258 | 555,691 | 534,217 | 555,518 | 629,660 | 956747 |
| *West Jordan Share* | *3.75%* | *4.36%* | *4.62%* | *4.99%* | *4.35%* | *4.38%* | 4.00% | 4.00% |

*Sources: [1] Salt Lake County 2002 - 2012 from OnTheMap, U.S. Census Bureau web application, 2015 from UT Depart of Workforce Services June 19, 2015 memorandum [2] West Jordan 2002 - 2012 from OnTheMap, U.S. Census Bureau web application, 2015 from May 2015 UT Department of Workforce Services, 2040 from Wasatch Front Regional Council Region 2015-2040 Regional Transportation Plan*

### *Estimated Nonresidential Floor Area*

To determine current employment and nonresidential floor area in the City, TischlerBise obtained the number of jobs in the City of West Jordan in 2012 from OnTheMap, the U.S. Census Bureau's web application. To estimate number of jobs in 2015, TischlerBise determined the City's recent share of Salt

Lake County employment (4 percent from 2010 to 2012) and applied that percentage to the County's May 2015 employment data. To convert employment to nonresidential square footage, the average square feet per employee factors from Figure A8 are used. Current (2015) estimates of employment and nonresidential square footage are shown below in Figure A10.

**Figure A10. City of West Jordan Estimated Nonresidential Floor Area**

| | 2012 All Jobs [1] | % | 2015 Jobs [2] | Sq Ft per Job [3] | Floor Area |
|---|---|---|---|---|---|
| Industrial/Warehousing | 7,589 | 30% | 7,830 | 558 | 4,369,368 |
| Retail, Accommodation & Food Services | 7,687 | 30% | 7,932 | 500 | 3,965,763 |
| All Other Services | 10,151 | 40% | 10,474 | 200 | 2,094,781 |
| TOTAL | 25,427 | 100% | 26,236 | | 10,429,912 |

*[1] Source: U.S. Census Bureau, OnTheMap web application, 2012 all jobs.*
*[2] Estimated based on West Jordan job growth as a share of Salt Lake County from 2010-2012 (4%).*
*[3] Industrial and Retail from "Employee and Building Area Ratios" (Figure A8); Office obtained from from local Sources: edcUTAH (Economic Development Corporation of Utah), Gardner Company, and Simons REALTORS.*

## *Employment and Nonresidential Floor Area Projections*

Based on projected total number of jobs described above, annual projections of employment growth can be derived. It is assumed that the distribution of new jobs will maintain the same distribution by type of employment as detailed in Figure A10. Nonresidential square footage is derived by multiplying the projected employment by the applicable square footage per employee. Results are shown in Figure A11.

**Figure A11. City of West Jordan Annual Nonresidential Development Projections**

| | | | | | | | ~~~Five-Yr Increments | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2025 | 2030 | 2035 | 2040 |
| ***Cumulative*** | | *Base Yr* | *1* | *2* | *3* | *4* | *5* | *10* | *15* | *20* | *25* |
| ***Job Projections*** | | | | | | | | | | | |
| Total Jobs | | 26,236 | 26,781 | 27,326 | 27,871 | 28,416 | 28,962 | 31,687 | 34,413 | 37,139 | 39,864 |
| | *%* | | | | | | | | | | |
| Industrial | *30%* | 7,830 | 7,993 | 8,156 | 8,319 | 8,481 | 8,644 | 9,457 | 10,271 | 11,085 | 11,898 |
| Retail | *30%* | 7,932 | 8,096 | 8,261 | 8,426 | 8,591 | 8,756 | 9,580 | 10,404 | 11,228 | 12,052 |
| Office | *40%* | 10,474 | 10,692 | 10,909 | 11,127 | 11,344 | 11,562 | 12,650 | 13,738 | 14,827 | 15,915 |
| *Annual Net Increase in Jobs* | | | *545* | *545* | *545* | *545* | *545* | *545* | *545* | *545* | *545* |
| ***Nonresidential Square Footage (1,000 SF)*** | | | | | | | | | | | |
| | *SF/Empl* | | | | | | | | | | |
| Industrial | *558* | 4,369 | 4,460 | 4,551 | 4,642 | 4,733 | 4,823 | 5,277 | 5,731 | 6,185 | 6,639 |
| Retail | *500* | 3,966 | 4,048 | 4,131 | 4,213 | 4,295 | 4,378 | 4,790 | 5,202 | 5,614 | 6,026 |
| Office | *200* | 2,095 | 2,138 | 2,182 | 2,225 | 2,269 | 2,312 | 2,530 | 2,748 | 2,965 | 3,183 |
| Total Nonres Sq. Ft. | | 10,430 | 10,647 | 10,863 | 11,080 | 11,297 | 11,514 | 12,597 | 13,681 | 14,764 | 15,848 |
| *Annual Net Increase in 1,000 SF* | | | *217* | *217* | *217* | *217* | *217* | *217* | *217* | *217* | *217* |

## AVERAGE DAILY VEHICLE TRIPS

### *Residential Vehicle Trip Rates*

As an alternative to simply using the national average trip generation rate for residential development, the Institute of Transportation Engineers (ITE) publishes regression curve formulas that may be used to derive custom trip generation rates using local demographic data. Key independent variables needed for the analysis (i.e., vehicles available, housing units, households, and persons) are available from the U.S. Census Bureau 2009-2013 American Community Survey (ACS) 5-year estimate data for the City of West Jordan. This data was used to derive custom average weekday vehicle trip ends by type of housing, as shown below in Figure A12. A vehicle trip end represents a vehicle either entering or exiting development, as if a traffic counter were placed across a driveway.

**Figure A12. Average Weekday Vehicle Trip Ends by Housing Type in City of West Jordan**

| West Jordan, Utah | | *Households (2)* | | | *Vehicles per* |
|---|---|---|---|---|---|
| | *Vehicles Available (1)* | *Single Family Units (3)* | *Multifamily Units* | *Total* | *Household by Tenure* |
| Owner-occupied | 55,373 | 22,982 | 565 | 23,547 | 2.35 |
| Renter-occupied | 11,693 | 2,948 | 4,245 | 7,193 | 1.63 |
| TOTAL | 67,066 | 23,547 | 24,112 | 30,740 | 2.18 |
| Housing Units (6) => | | 26,587 | 5,559 | 32,146 | |

| | *Persons (4)* | *Trip Ends (5)* | *Vehicles by Type of Housing* | *Trip Ends (6)* | *Average Trip Ends* | *Trip Ends per Housing Unit* |
|---|---|---|---|---|---|---|
| Single Family Units | 94,292 | 244,011 | 58,837 | 340,113 | 292,062 | **11.0** |
| Multifamily Units | 11,270 | 39,042 | 8,229 | 32,717 | 35,880 | **6.5** |
| TOTAL | 105,562 | 283,053 | 67,066 | 372,830 | 327,942 | **10.2** |

(1) Vehicles available by tenure from Table B25046, American Community Survey, 2013.
(2) Households by tenure and units in structure from Table B25032, American Community Survey, 2013.
(3) Single Family units include detached homes, attached homes and mobile homes.
(4) Persons by units in structure from Table B25033, American Community Survey, 2013.
(5) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.91*LN(persons)+1.52). To approximate the average population of the ITE studies, persons were divided by 169 and the equation result multiplied by 169. For multifamily housing (ITE 220), the fitted curve equation is (3.47*persons)-64.48.
(6) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.99*LN(vehicles)+1.81). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 229 and the equation result multiplied by 229. For multifamily housing (ITE 220), the fitted curve equation is (3.94*vehicles)+293.58.

### *Nonresidential Vehicle Trip Rates*

Vehicle trips rates for nonresidential development are from the reference book, *Trip Generation* published by the Institute of Transportation Engineers (ITE) in 2012.

### *Trip Rate Adjustments*

Trip generation rates are adjusted to avoid double counting each trip at both the origin and destination points. Therefore, the basic trip adjustment factor is 50 percent. As discussed below, additional adjustments are made to ensure the fees are proportionate to the infrastructure demand for particular types of development.

### *Adjustment for Journey-To-Work Commuting*

According to the National Household Travel Survey (2009), home-based work trips are typically 31 percent of "production" trips, or, in other words, out-bound trips (which are 50 percent of all trip ends). Also, Census Bureau's web application "OnTheMap" indicates that 91 percent of West Jordan's workers travel outside the City for work. In combination, these factors (0.31 x 0.50 x 0.91 = 0.14) account for 14 percent of additional production trips. The total adjustment factor for residential includes attraction trips (50% of trip ends) plus the journey-to-work commuting adjustment (14% of production trips) for a total of 64 percent (Figure A13).

**Figure A13. Adjustment for Journey-to Work Commuting**

| | |
|---|---|
| Employed West Jordan Residents (2012) | 49,231 |
| West Jordan Residents Working in City (2012) | 4,242 |
| West Jordan Residents Commuting Outside City for Work | 44,989 |
| **Percent Commuting out of the City** | **91%** |
| Additional Production Trips | 14% |
| ***Residential Trip Adjustment Factor*** | ***64%*** |

*Source: U.S. Census, OnTheMap Application*
*Longitudinal-Employer Household Dynamics (LEHD) Program; ITE*

### *Adjustment for Pass-By Trips*

The basic trip adjustment factor of 50 percent is applied to the Office/Institutional and Industrial categories. The Retail category has a trip factor of less than 50 percent because this type of development attracts vehicles as they pass-by on arterial and collector roads. For an average size shopping center, the ITE manual indicates that an average size shopping center has a pass-by rate of 34 percent.

### *Estimated Vehicle Trips in West Jordan*

As shown in Figure A14 there are an average of 299,111 vehicle trips generated by existing development in the City of West Jordan on an average weekday. As the table indicates, residential development is estimated to generate 215,804 vehicle trips compared to 83,307 vehicle trips generated by nonresidential development. An example of the calculation is as follows for detached units: 26,907 single family units x 11 vehicle trips per day per unit x 64% adjustment factor = 189,425 total vehicle trips per day from single family units in the City.

**Figure A14. Average Daily Trips**

| ***Residential Vehicle Trips on an Average Weekday (2014)*** | | |
|---|---|---|
| ***Residential Units*** | *Assumptions* | |
| Single Family | 26,907 | |
| Multifamily | 6,341 | |
| **Average Weekday Vehicle Trip Ends per Unit*** | *Trip Rate* | *Trip Factor* |
| Single Family | 11.00 | 64% |
| Multifamily | 6.50 | 64% |
| **Residential Vehicle Trip Ends of an Average Weekday** | | |
| Single Family | 189,424 | |
| Multifamily | 26,379 | *% of total* |
| **Total Residential Trips** | **215,804** | ***72%*** |

| ***Nonresidential Vehicle Trips on an Average Weekday (2014)*** | | |
|---|---|---|
| **Nonresidential Gross Floor Area (1,000 sq. ft.)** | *Assumptions* | |
| Industrial | 4,369 | |
| Retail | 3,966 | |
| Office | 2,095 | |
| **Average Weekday Vehicle Trips Ends per 1,000 Sq. Ft.** | *Trip Rate* | *Trip Factor* |
| Industrial | 3.82 | 50% |
| Retail | 42.70 | 34% |
| Office | 16.60 | 50% |
| **Nonresidential Vehicle Trips on an Average Weekday** | | |
| Industrial | 8,345 | |
| Retail | 57,575 | |
| Office | 17,387 | *% of total* |
| **Total Nonresidential Trips** | **83,307** | ***28%*** |
| | | |
| **TOTAL TRIPS** | **299,111** | ***100%*** |

**Trip rates are customized for City of West Jordan See accompanying tables and discussion.*
***Trip rates are from the Institute of Transportation Engineers (ITE) Trip Generation Manual (2012)*

## DEMAND INDICATORS BY SIZE OF HOUSING

Custom tabulations of demographic data by bedroom range were created from individual survey responses provided by the U.S. Census Bureau, in files known as Public Use Micro-data Sample (PUMS). Because PUMS files are only available for areas of roughly 100,000 persons, the City of West Jordan is included with other jurisdictions. In addition, the City is included in two Public Use Micro-data Areas (PUMA): PUMAs 35006 and 35007. TischlerBise derived persons per housing unit and trip rates by bedroom count for both single family units and multifamily units using the data from these files.

Figure A15 is for **single family units** and shows trip generation rates and average persons per housing unit by bedroom range, from PUMS data. Recommended multipliers were scaled to make the average value for all housing units in PUMAs 35006 and 35007 match the average value derived from 2009-2013 American Community Survey 5-year data for the City of West Jordan.

### Figure A15. Single Family Trip Generation Rates and Household Sizes by Bedroom Count

| City of West Jordan, Utah | | | | | | | Recommended Multipliers (4) | |
|---|---|---|---|---|---|---|---|---|
| *Single Family* | *Persons (1)* | *Trip Ends (2)* | *Vehicles Available (1)* | *Trip Ends (3)* | *Average Trip Ends* | *Housing Units (1)* | *Trip Ends per Housing Unit* | *Persons per Housing Unit* |
| 0-3 Bedrooms | 3,233 | 9,394 | 2,401 | 14,047 | 11,721 | 1,192 | 9.0 | 2.76 |
| 4 Bedrooms | 3,372 | 9,761 | 2,310 | 13,520 | 11,640 | 980 | 10.9 | 3.50 |
| 5 Bedrooms | 2,969 | 8,694 | 1,945 | 11,403 | 10,048 | 732 | 12.5 | 4.13 |
| 6+ Bedrooms | 2,013 | 6,104 | 1,202 | 7,081 | 6,593 | 420 | 14.3 | 4.88 |
| GRAND TOTAL | 11,587 | 33,953 | 7,858 | 46,050 | 40,002 | 3,324 | 11.0 | 3.55 |

(1) 2009-2013 American Community Survey 5-year Estimates, Public Use Microdata Sample for UT PUMAs 35006 and 35007.
(2) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.91*LN(persons)+1.52). To approximate the average population in the ITE studies, persons were divided by 21 and the equation result multiplied by 21.
(3) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2012). For single family housing (ITE 210), the fitted curve equation is EXP(0.99*LN(vehicles)+1.81). To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 31 and the equation result multiplied by 31.
(4) Recommended multipliers are scaled to make the average value by type and size of single family housing for PUMAs 00502 and 00507 match the average value derived for the City of West Jordan from 2009-2013 American Community Survey 5-year data.

Figure A16 is for **multifamily units** and shows trip generation rates and average persons per housing unit by bedroom range, from PUMS data. Recommended multipliers were scaled to make the average value for all housing units in PUMAs 35006 and 35007 match the average value derived from 2009-2013 American Community Survey 5-year data for the City of West Jordan.

### Figure A16. Multifamily Trip Generation Rates and Household Sizes by Bedroom Count

| City of West Jordan, Utah | | | | | | | Recommended Multipliers (4) | |
|---|---|---|---|---|---|---|---|---|
| *Multifamily* | *Persons (1)* | *Trip Ends (2)* | *Vehicles Available (1)* | *Trip Ends (3)* | *Average Trip Ends* | *Housing Units (1)* | *Trip Ends per Housing Unit* | *Persons per Housing Unit* |
| 0-1 Bedrooms | 199 | 626 | 132 | 814 | 720 | 153 | 4.5 | 1.27 |
| 2 Bedrooms | 398 | 1,317 | 247 | 1,267 | 1,292 | 183 | 6.7 | 2.12 |
| 3+ Bedrooms | 285 | 924 | 148 | 877 | 901 | 88 | 9.7 | 3.16 |
| GRAND TOTAL | 882 | 2,867 | 527 | 2,957 | 2,912 | 424 | 6.5 | 2.03 |

(1) 2009-2013 American Community Survey 5-year Estimates, Public Use Microdata Sample for UT PUMAs 35006 and 35007.
(2) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2012). For multifamily housing (ITE 220), the fitted curve equation is (3.47*persons)-64.48.
(3) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2012). For multifamily housing (ITE 220), the fitted curve equation is (3.94*vehicles)+293.58.
(4) Recommended multipliers are scaled to make the average value by type and size of single family housing for PUMAs 00502 and 00507 match the average value derived for the City of West Jordan from 2009-2013 American Community Survey 5-year ACS data.

## DETAILED DEVELOPMENT PROJECTIONS

Demographic data shown in Figure A17 provides key inputs for updating development fees in the City of West Jordan. Cumulative data are shown at the top and projected annual increases by type of development are shown at the bottom of the table. As discussed earlier, TischlerBise recommends the use of persons per housing unit to derive impact fees. Therefore, vacancy rates and number of households are not essential to the demographic analysis.

## Figure A17. Annual Demographic Data

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2030 | 2035 | 20-Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Cumulative*** | *Base Yr* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *15* | *20* | **Net Increase** |
| Population | 106,021 | 107,878 | 109,734 | 111,591 | 113,447 | 115,304 | 117,470 | 119,636 | 121,802 | 123,968 | 126,134 | 136,963 | 147,793 | 41,772 |
| Jobs | 26,236 | 26,781 | 27,326 | 27,871 | 28,416 | 28,962 | 29,507 | 30,052 | 30,597 | 31,142 | 31,687 | 34,413 | 37,139 | 10,903 |
| | | | | | | | | | | | | | | |
| *Housing Units* | *33,222* | *33,822* | *34,422* | *35,022* | *35,622* | *36,222* | *36,922* | *37,622* | *38,322* | *39,022* | *39,722* | *43,223* | *46,723* | *13,501* |
| Single Family Units | 25,382 | 25,802 | 26,222 | 26,642 | 27,062 | 27,482 | 27,972 | 28,462 | 28,952 | 29,442 | 29,932 | 32,382 | 34,833 | 9,451 |
| Multifamily Units | 7,840 | 8,020 | 8,200 | 8,380 | 8,560 | 8,740 | 8,950 | 9,160 | 9,370 | 9,580 | 9,790 | 10,840 | 11,890 | 4,050 |
| Jobs to Housing Ratio | 0.79 | 0.79 | 0.79 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.79 | |
| | | | | | | | | | | | | | | |
| Nonres Sq Ft in thousands (KSF) | | | | | | | | | | | | | | |
| Industrial | 4,369 | 4,460 | 4,551 | 4,642 | 4,733 | 4,823 | 4,914 | 5,005 | 5,096 | 5,186 | 5,277 | 5,731 | 6,185 | |
| Retail/ Restaurant | 3,966 | 4,048 | 4,131 | 4,213 | 4,295 | 4,378 | 4,460 | 4,543 | 4,625 | 4,707 | 4,790 | 5,202 | 5,614 | |
| Office/ Institutional | 2,095 | 2,138 | 2,182 | 2,225 | 2,269 | 2,312 | 2,356 | 2,399 | 2,443 | 2,487 | 2,530 | 2,748 | 2,965 | |
| Total | 10,430 | 10,647 | 10,863 | 11,080 | 11,297 | 11,514 | 11,730 | 11,947 | 12,164 | 12,380 | 12,597 | 13,681 | 14,764 | |
| Avg Sq Ft Per Job | 398 | 398 | 398 | 398 | 398 | 398 | 398 | 398 | 398 | 398 | 398 | 398 | 398 | |
| Nonres. Veh. Trips | 83,307 | 85,038 | 86,769 | 88,500 | 90,231 | 91,962 | 93,693 | 95,424 | 97,155 | 98,886 | 100,617 | 109,272 | 117,927 | |
| | | | | | | | | | | | | | | ***2015-2035*** |
| ***Annual Increase*** | | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | 24-25 | 29-30 | 34-35 | ***Avg Anl*** |
| Population | | 1,857 | 1,857 | 1,857 | 1,857 | 1,857 | 2,166 | 2,166 | 2,166 | 2,166 | 2,166 | 2,166 | 2,166 | 2,089 |
| Jobs | | 545 | 545 | 545 | 545 | 545 | 545 | 545 | 545 | 545 | 545 | 545 | 545 | 545 |
| Housing Units | | 600 | 600 | 600 | 600 | 600 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 675 |
| Industrial (1,000 SF) | | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Retail/ Restaurant (1,000 SF) | | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 |
| Office/ Institutional (1,000 SF) | | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| | | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 | 217 |