Development Fees Study
Town of Keenesburg, Colorado

Prepared for

Town of Keenesburg
140 South Main Street
Keenesburg, Colorado 80643

Prepared by

Telesto Solutions Inc.
3801 Automation Way, Suite 201
Fort Collins, Colorado 80525

April 2017

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SOLUTIONS • INCORPORATED

Signature Page

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Report Authors and Contributors

Telesto Solutions, Inc.

_____
Taryn Tigges – Primary Author

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Kent Bruxvoort – Report Review

Contributors:

Corrie Kaiser

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 EXECUTIVE SUMMARY

The Town of Keenesburg (Town) is considering updating its development fees, including both impact fees and tap fees, as well as its raw water acquisition fee. The development fees are to be imposed to fund the capital infrastructure needed to serve demands posed by new development. Capital infrastructure to be impacted by new development includes roadways, storm drainage, parks, and public facilities, including facilities for general community services and for police services. Tap fees were evaluated for both the Town's water and sewer enterprises. This study recommends an increase in cumulative impact fees and a slight decrease in tap fees as compared to the Town's existing fees as necessary to defray those impacts directly related to anticipated growth.

2.0 INTRODUCTION

The Town is a statutory town located in southeast Weld County, approximately 25 miles southeast of the county seat of Greeley and approximately 35 miles northeast of Denver on I-76 at exit 39. The Town anticipates population growth at an annual rate of 4 percent over the next 20 years.

The Town has previously established impact fees and tap fees under the principle that growth will pay its own way. This study develops a capital improvements plan to provide services to meet the needs of Town growth, and establishes a level of impact fees and tap fees to pay for the cost of those expanded growth-related services.

Impact fees are one-time fees, collected at the time of the building permit. Tap fees are paid at the time of the building permit based on the level of water and sewer service required by the individual applicant as requested from the Town. The need and level of specific development fees were evaluated by Telesto Solutions, Inc. (Telesto) in this study and are proposed to meet criteria established by State statute (Colorado Revised Statutes Title 29, Article 20) and recognized by the courts. Impact and tap fees are proposed herein based on the following criteria:

1. Development fees will be adopted through the Town's legislative process.

2. Impact fees will be applicable to a broad class of property. Tap fees will also be applicable to a broad class of property as defined by the level of service required.
3. Development fees will defray the projected impacts on capital facilities caused by proposed development.
4. The established development fees will be quantified based on the reasonable impacts of proposed development on existing capital facilities at a level no greater than necessary to defray such impacts directly related to proposed development.
5. No development fee will be imposed to remedy a deficiency in capital facilities that may exist without regard to proposed development.
6. No individual landowner will be required to provide a site-specific dedication or improvement to meet the same need for capital facilities for which the development fee is imposed.

The current impact fees and tap fees implemented by the Town total $15,800 per new building permit for a detached single family dwelling. This total includes $8,000 for a water tap, $6,500 for a sewer tap, and $1,300 in impact fees. Impact fees include $300 for storm drainage, $500 for parks, and $500 for streets. This report evaluates what level of impact and tap fees for single-family, multi-family and commercial development is appropriate to fund capital expenditures to provide Town services to those who directly benefit from those services. Adjustments are recommended as determined reasonable and proportional to anticipated impact. Impact fees are discussed in Section 3.0 and tap fees in Section 4.0.

3.0 IMPACT FEES

3.1 General Approach

Telesto evaluated the municipal services currently provided by the Town, and those determined to be required by growth in population. Figure 1 provides a capital project funding model. Capital projects are those civil improvements or facilities, with a useful life of five years or longer, required to provide services to the municipality's residents. These projects are a part of the capital infrastructure that derives its funding through 1) sales and other taxes and monthly utility rates collected from existing residents and 2) from impact and tap fees from population growth represented in new land development. The existing population base funds administration, operations and maintenance, debt, and capital

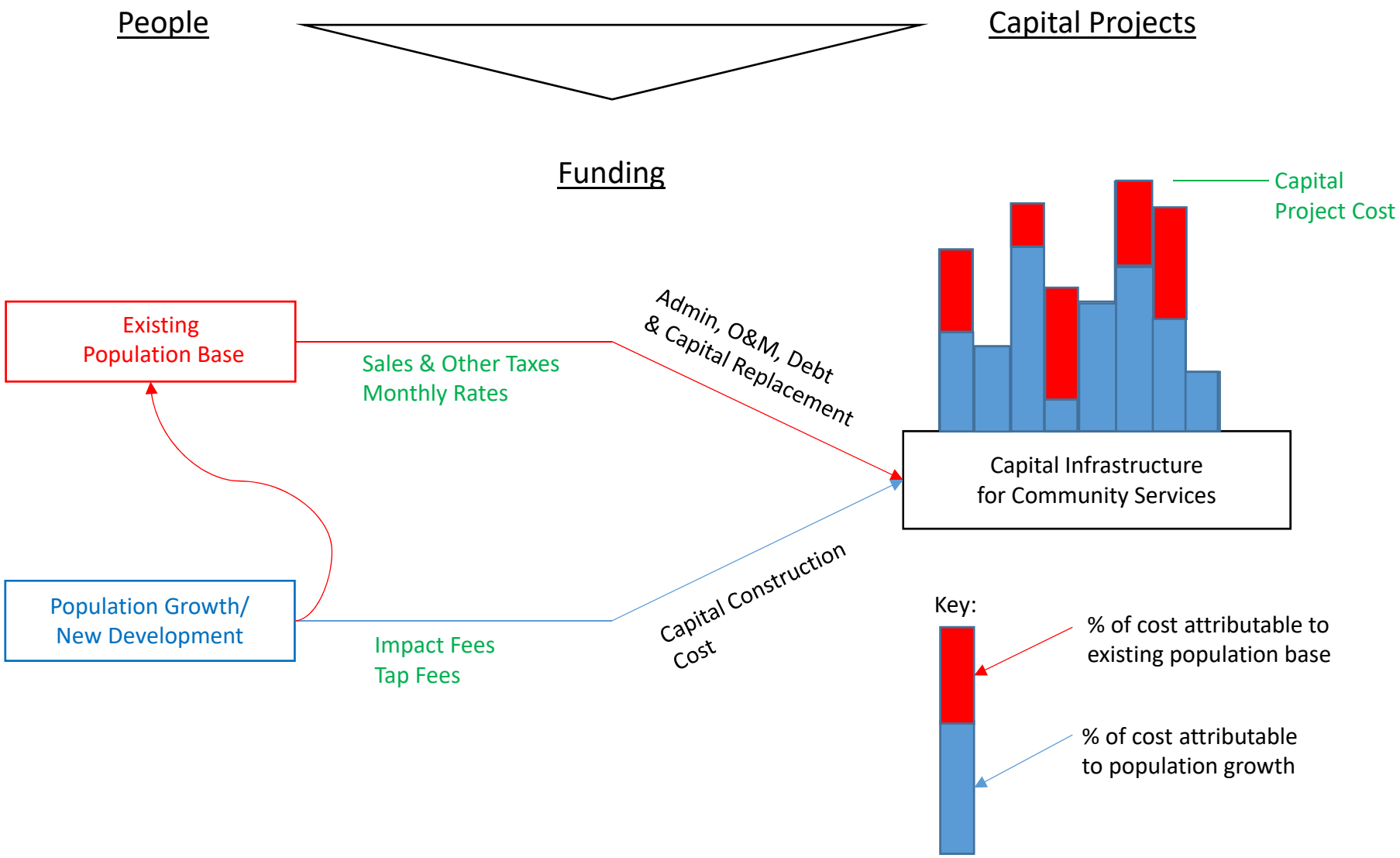

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FIGURE 1
CAPITAL PROJECTS MODEL

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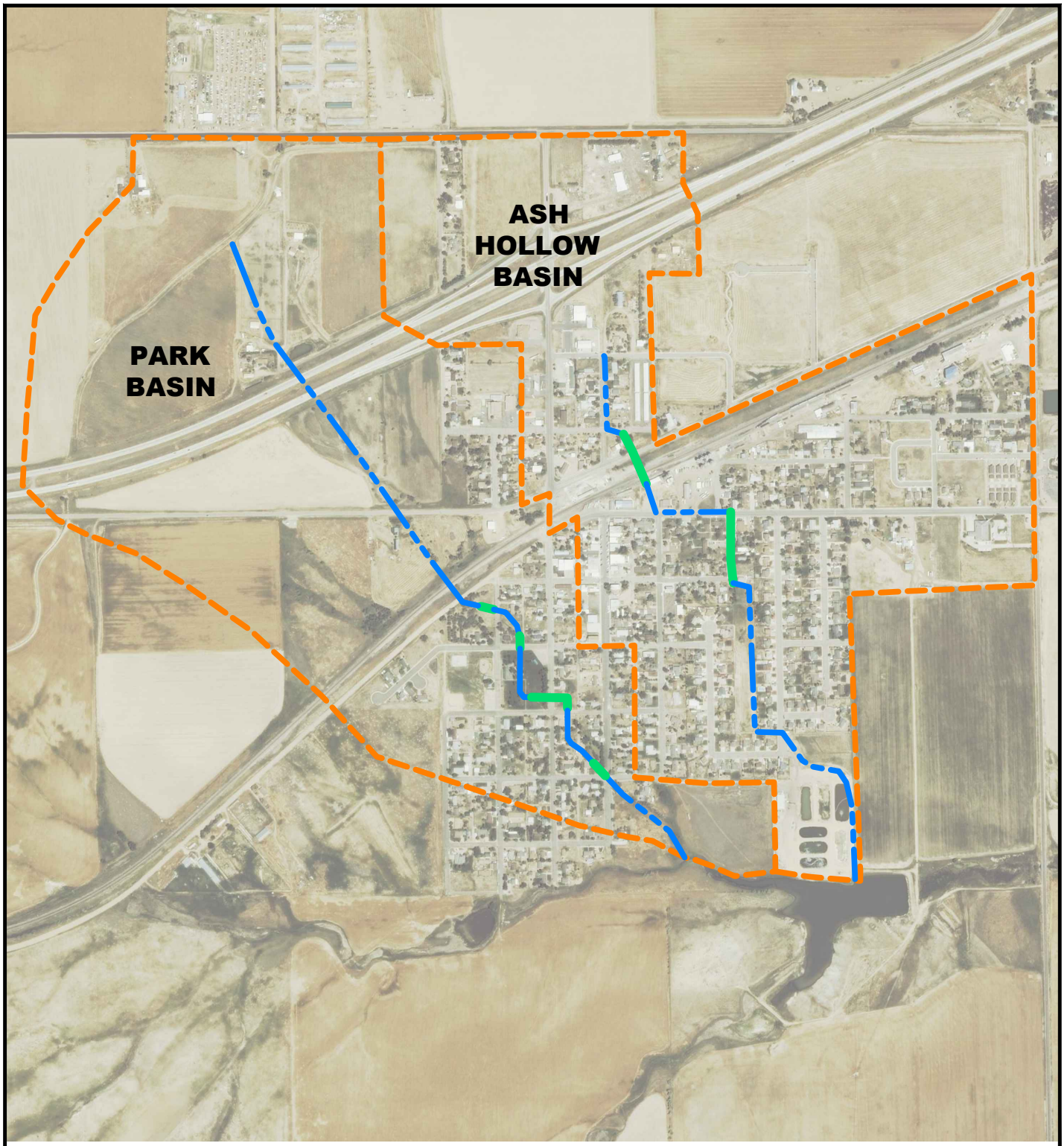

LEGEND

- WATERSHED BOUNDARY
- EXISTING DRAINAGE PATH
- PROPOSED CLUVERT

NOTE:
A REGIONAL DETENTION POND IS RECOMMENDED IN THE PARK BASIN WITH LOCATION TO BE DETERMINED.

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SCALE IN FEET

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COORDINATE SYSTEM
COLORADO STATE PLANE

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FIGURE 2
DRAINAGE BASINS MAP

PREPARED FOR: TOWN OF KEENESBURG, STATE OF COLORADO

Date: 3/13/2017 4:26:36 PM R:\Keenesburg\Calculations\AutoCad\2015-02-20-Water-Sewer-Well-Maps\Figure 1 Drainage Basin Map.dwg Plotted By: Stacy Tyler

replacement of that infrastructure. Development growth fees pay for new or expanded capital projects required to meet the needs of that growth.

An approximate 20-year (2017 through 2035) capital improvements plan (CIP) is presented in the next section. The CIP identifies those capital projects determined to be necessary to provide services to meet growth demands. Telesto estimated the capital costs for anticipated capital projects. For each capital project, we determined whether the project would be wholly, or only partially, driven by the requirements of growth, and we allocated that appropriate percentage accordingly either to growth or to the existing population base. The allocation of costs between the existing population base and development growth was performed to ensure that impact fees or tap fees would be reasonable and proportional to those impacts directly related to proposed development, and to ensure that any deficiency in capital facilities that exists without regard to proposed development would not be included in the impact or tap fees.

Furthermore, impact fees and tap fees were evaluated for single family residential, multi-family residential, and commercial development growth.

The percentage of the capital improvement cost estimated to be related to development growth was used to estimate the corresponding revenue that would be needed from impact fees to pay for those improvements. Telesto determined that impact fees would be required to meet growth demands to address the following municipal service need areas:

- Safe and efficient rights-of-way
- Storm drainage management and protection against a level of flooding impacts in existing Town drainage basins
- Public recreation opportunities
- Efficient and productive government service
- Increased police service

Therefore, as the Town expands in population through the construction of new residences and businesses, the expanding population will require the following municipal services to meet these needs:

- Roadway improvements, including new arterial roads and improvements to existing roads required to serve expanded demand
- Storm drainage improvements, as required to address the additional runoff from new development contributed to drainage infrastructure
- Parks, to provide recreation services to an expanding population base
- Public facilities, including a community center, to provide a continuing high level of government services to a growing community
- Police facilities, to house expanded police services proportionate to population growth

The impact fees were thus divided into the above five types of capital infrastructure accounts. Telesto proposed specific capital projects, and preliminary input from the Town's Board of Trustees was provided, in creating the CIP. A total of seven specific capital improvement areas or projects were determined to be required to meet the needs of the expanding population base:

Roadways

- New arterial road segments
- Improvements to existing streets

Storm Drainage

- Drainage system improvements

Parks

- New community park
- Improvements to Schey Park

Public Facilities

- New town hall

Police Facilities

- In-town facilities to house police services

3.2 Keenesburg's Capital Improvements Plan

Each of the proposed capital projects is discussed below. The percentage of the overall capital project cost for any given project allocated to development growth depends on the demand that growth places on that particular capital project relative to the corresponding

demand placed by existing residents. Thus, it is important to quantify the percentage of the Town's total population that is due to development growth over the life of the projects in the CIP.

The Town's 2016 population, estimated from US census data, is 1,243. The projected population in the year 2035, at a 4 percent annual growth rate, is estimated to be 2,619. Thus, growth is estimated to be 1,375 persons over this time frame, and post-2016 population growth is estimated to account for 55% of the total Town population in 2035.

3.2.1 Roadways

Although specific sites for development growth cannot be foreseen, we can expect that resources will be dedicated to providing safe and sufficient roadways to meet development transportation needs. We estimate that approximately 1.5 miles of new arterial roads will be needed to support growth. In addition, we estimate that approximately 1.0 mile of existing Town roadways will need upgrades due to the demand of increased traffic. Based on realized 2016 Town roadway maintenance unit costs, the cost of constructing new arterials is estimated to cost $150 per linear foot and the cost of upgrading streets to serve a higher level of multi-modal (vehicle, bicycle, and pedestrian) traffic is estimated to cost $80 per linear foot. All of the cost for new arterial roadways is allocated to development growth. Telesto assumes that improvements to existing roadways will be required based on both existing traffic use and on increases in traffic from development growth. Thus, we allocate 55% of existing roadway upgrades to development growth.

3.2.2 Storm Drainage

There are two primary storm drainage basins in the current Town area, as depicted on Figure 2. The western of these two basins conveys stormwater through Schey Park and is identified in this report as the Park Basin. The eastern of these two basins conveys stormwater through Ash Hollow Park and is identified here as the Ash Hollow Basin. Both drainage basins have limited storm drainage infrastructure and should be improved for more effective conveyance of stormwater and decreased flooding potential. Future infill development within these basins would generally increase the amount of impervious area

and thereby incrementally increase storm peak discharges. For infill development growth, without a corresponding site-specific drainage plan to offset the imperviousness impacts of the development, a storm drainage impact fee is recommended.

Development growth outside these two drainage basins would likely occur in almost entirely undeveloped areas, where storm drainage planning and detention would be required to offset development impacts on historical drainage conditions. In this case, no storm drainage impact fee would be required.

Future storm drainage improvements within the Park Basin are recommended to improve system performance and mitigate against flooding impacts. A new regional detention pond and approximately 500 feet of storm pipe are anticipated to be needed. Existing Town residents would also benefit from potential new infrastructure and system upgrades. We estimate that growth will contribute approximately 10% of the need for storm system upgrades over the 20-year life of the CIP. The regional detention pond is estimated to cost approximately $200,000 and storm pipe is estimated to cost $525 per linear foot.

Similarly for the Ash Hollow Basin, future storm drainage improvements are recommended to mitigate against flooding impacts, especially in the vicinity of CR 398 and along Stewart Street. Approximately 700 feet of storm pipe is estimated to be needed. As is the case with the Park Basin, we estimate that growth will contribute to approximately 10% of the need for storm system upgrades over the 20-year life of the CIP. The storm pipe improvements are estimated to cost $525 per linear foot.

3.2.3 Parks

To address the demand for recreation areas as the Town growth is here projected to more than double over the 20-year CIP life, a need for park upgrades and a new eastside community park is anticipated. Upgrades to Schey Park are estimated to cost $250,000. A new 8-acre eastside park is estimated to cost $150,000 per acre. Demand for Schey Park upgrades by development growth is estimated to account for 20% of the total upgrade cost. However, the need for a new park would primarily be driven by growth; therefore, new

development would contribute 80% of the cost of the new park. These costs do not include land acquisition costs—in both instances the Town already owns the land.

3.2.4 General Government Facility

Additional government services will be required to meet the needs of development growth. It is expected that a new town hall would be required to meet those needs. The cost to build a 4,800 square foot town hall is estimated to be $250 per square foot. The lot is estimated to cost $150,000. Growth is anticipated to contribute 55% of the demand for a new town hall.

3.2.5 Police Services Facility

The Town currently contracts police services. As the population grows the Town will benefit from a police services facility, whether those services are provided by contract or by a Town police force. Telesto assumes that the existing Town Hall would be renovated to provide a suitable police services facility, at an estimated cost of $400,000.

3.2.6 CIP Summary

A summary of the Town's proposed CIP, with specific proposed projects, and the cost attributable to development growth demand is presented in Table 3-1.

Table 3-1 Capital Improvements Plan

Project	Total Estimated Cost	% Attributed to Growth	Estimated Share by Development
New arterials	$1,188,000	100%	$1,188,000
Street upgrades	$422,400	55%	$232,320
Drainage upgrades	$830,000	10%	$83,000
Schey Park	$250,000	20%	$50,000
New park	$1,200,000	80%	$960,000
New town hall	$1,350,000	55%	$742,500
Police Services Facility	$400,000	55%	$220,000
Total	**$5,285,400**	**-**	**$3,475,820**

3.3 Methodology for Impact Fees Calculation

The impact of development growth is evaluated for residential and non-residential land use types, with the objective of estimating the degree to which development growth's impact upon required Town services can be apportioned based on land use. For the 1,375 people that are estimated to make up population growth over the next approximately 20 years, and given a typical household size of 2.91 persons/household, the estimated total number of residential permits is 474. Telesto assumes based on existing water and sewer tap data that the total number of commercial permits would be about 5 percent of the number of residential permits, or approximately 24 permits.

3.3.1 Relative Impacts by Land Use Type

Differing types of development growth create different demands upon Town services, and should therefore pay differing levels of impact fees. Methods for assessing the relative impacts of single-family residential, multi-family residential, and commercial land use on the five categories of impacts listed above are determined by Telesto as described below. The detail underlying the assessment is provided in spreadsheets attached in Appendix A.

Impacts on Roadways

Development growth will place demand on Town streets proportional to the volume of traffic created. In turn, traffic volumes are dependent upon land use type. Daily trips generated by each type of land use are estimated, as summarized in Table 3-2, from National Household Travel Survey (U.S. Department of Transportation, 2009) data. The Travel Survey estimates 3.8 daily trips per person, based on nationwide averages, and reports these trips by trip purpose (i.e., trips to the store, to school, to work, or for other personal purposes). Telesto approximates these daily trips based on the land use types evaluated in this study, estimates the number of persons per vehicle for each land use type, and determines the daily vehicle trips for each land use type (per residence or per 1,000 sf for non-residential uses), as listed in Table 3-2. The result is an estimate of impact to Town roadways weighted by type of use. It can be noted that the aggregate number of daily trips

corresponds, at a household density of approximately 2.91 persons per household, to 11 daily trips on Town roads for each new residential building permit issued.

Table 3-2 Estimated Average Daily Vehicle Trips per Land Use Type

Land Use Type	Daily Trips/ Person by Trip Purpose	Estimated Number of Permits	Daily Vehicle Trips/Residential Unit or 1,000 sq. ft. of Building Footprint
Residential	2.4	474	4.32
Commercial/Retail	0.6	12	4.01
Office	0.3	3	7.34
Warehouse	0.1	1	2.29
Industrial	0.1	6	1.15
Public/Institutional	0.3	2	6.48
Total	**3.8**	**498**	**-**

Impacts on Storm Drainage

The impact that development growth has on the Town's storm drainage system is related to existing runoff conditions within the drainage basin in which the development is located, to the amount of increased runoff created by the development, and whether runoff impact is otherwise mitigated with the proposed development. Impact is directly related to the increase in impervious area (or loss of pervious area) of the development and whether on-site detention of storm runoff will occur. Therefore, the storm drainage fee can be proportioned to the expected amount of impervious area proposed with each new building permit. The estimated amount of impervious area added by new development within the two Town drainage basins shown in Figure 2, and not providing on-site mitigation for increased drainage, is approximately 12 acres. Table 3-3 summarizes the calculation of potential drainage impact by land use type, for the estimated number of permits in the two existing Town basins. Appendix B provides a table listing the Town's streets and addresses located in each of the basins shown in Figure 2.

Table 3-3 Impervious Area Determination for Storm Drainage Fee

Land Use Type	Percent Impervious of Lot[1]	Estimated Number of Lots in Town Drainage Basins	Estimated Impervious Area (acres)
Single-Family	45%	30	2.4
Multi-Family	75%	12	1.1
Commercial /Retail	75%	4	3.0
Office	75%	2	1.5
Warehouse	85%	0	0
Industrial	85%	1	1.7
Public/Institutional	55%	1	1.1
Total	**-**	**50**	**10.8**

[1] Impervious percentages are from the Urban Drainage and Flood Control District (UDFCD).

Impacts on Parks

Non-residential developments is not expected to have a direct impact on community parks; therefore, no parks improvements fee will be imposed on non-residential developments. The parks fee will be applied to single family and multi-family residential building permits, whose residents create demand upon parks and recreation facilities.

Impacts on Community Services

Both residential and non-residential development place a demand on general government services. Telesto estimates that demand for these services is generated on a per-lot or per-site basis. Thus, the cost for a new town hall can be allocated equally across land use types on a by-permit basis. However, Telesto applied a multiplier of 0.75 for multi-family units to account for generally smaller per-unit demand for community center services required by multi-family residences as compared to single family residences and non-residential lots.

Impacts on Police Services

Police services required can be expected to be roughly proportional to the number of people at a particular location at any given time; therefore, it is appropriate to separate fees directly related to police services by land use type. The methodology selected here for determining the allocation of fees is to determine the functional population, which is defined as the number of people occupying a space on a 24-hour basis. The methodology assumes that the greater the number of people occupying space at any given time, the greater the demand

on police services, and that those land use categories typically requiring a greater level of police service should pay a proportionately larger impact fee.

For residential developments, the functional population is dependent on the average household size and the time spent at home. Town data indicate the overall average household size to be approximately 2.91 people. This is assumed to apply to single family dwellings, which is the majority of housing units in the Town. Not enough data exists to know what the average household size is for multi-family residences in Keenesburg. However, City of Greeley data indicate that the typical multi-family household size is three-quarters that of single-family homes. It is also assumed that each resident spends an average of 14 out of 24 hours per day at home. Table 3-4 presents the calculation of functional population for residential land uses.

Table 3-4 Residential Functional Populations

Land Use Type	Average Household Size	Occupancy	Functional Population/Residence
Single-Family, Detached	2.91	0.58	1.69
Multi-Family	2.18	0.58	1.27

The functional population at non-residential units is calculated by estimating how many people per square foot will be at the land use each day and estimating the average time people will spend at that location. The National Household Travel Survey (U.S. Department of Transportation, 2009) is used to estimate the number of trips each Town resident would make to each type of non-residential development per day. The mean square feet per employee and mean building size are obtained from the U.S. Energy Information Administration (U.S. EIA) website (EIA, 2012). Table 3-5 summarizes the estimated non-residential functional population, under the assumption that employees spend 8 hours per day and visitors spend 1 hour per day at the site.

Table 3-5 Non-Residential Functional Populations

Land Use Type	Employees/1,000 sq. ft. of Building Footprint	Visitors per Day/1,000 sq. ft. of Building Footprint	Functional Population/1,000 sq. ft. of Building Footprint
Commercial/Retail	0.8	160	6.92
Office	2.1	48	2.63
Warehouse	0.5	5	0.37
Industrial	0.8	15	0.87
Public/Institutional	0.6	45	2.05

3.4 Recommended Impact Fees

Telesto refers to the CIP and the impact evaluation methodology, both described above, to estimate the reasonable impact fees to offset the demand placed on Town infrastructure by development growth, allocated proportionately among the various land use types.

3.4.1 Roadways Impact Fees

To pay for $1,188,000 in new arterials and 55% of the cost to upgrade existing streets, estimated at $232,320, an average roadways impact fee of $2,850 will be required per building permit. This fee is allocated by land use type as shown in Table 3-6, based on the estimated traffic in daily vehicle trips associated with each land use type.

Table 3-6 Street Improvements Impact Fee by Land Use Type

Land Use Type	Estimated Permits	Street Improvements Fee	Capital Raised by 2035 (2017 $)
Single Family Residential	403	$1,905 per unit	$767,700
Multi-Family Residential	71	$1,430 per unit	$101,500
Commercial/Retail	12	$1,705 per 1,000 sf	$200,500[1]
Office	3	$3,115 per 1,000 sf	$152,200
Warehouse	1	$970 per 1,000 sf	$50,700
Industrial	6	$485 per 1,000 sf	$50,600
Public/Institutional	2	$2,750 per 1,000 sf	$95,700
Total	**498**	**-**	**$1,419,000**

[1]Estimates of capital raised for non-residential uses assume 120,000 sq. ft. of new commercial/retail floor space, 49,000 sq. ft. of office floor space, 52,000 sq. ft. of warehouse floor space, 104,000 sq. ft. of industrial floor space, and 35,000 sq. ft. of public/institutional floor space.

3.4.2 Storm Drainage Impact Fees

As discussed above, development growth will contribute to approximately 10% of the demand for the Town's anticipated storm drainage improvements within the Park and Ash Hollow Basins. To meet 10% of the $830,000 project cost, the recommended storm drainage impact fee is an average of approximately $1,660 per building permit for infill development within these basins. Based on the total estimated impervious areas anticipated for development within these basins, impact fees should be collected at a rate of $0.175 per square foot of impervious area, unless storm water detention is to be provided as part of the development proposed with the permit application. Impervious area is considered to be any portion of the lot covered by building, concrete, asphalt, or other surface that essentially prevents precipitation from infiltrating. Corresponding fees raised to fund this need, as allocated by land use type, are shown in Table 3-7.

Table 3-7 Storm Drainage Impact Fee by Land Use Type

Land Use Type	Estimated Permits	Average Impact Fee per Permit, Assessed at $0.175/sf of Impervious Area	Capital Raised by 2035 (2017 $)
Single Family Residential	30	$620	$18,600
Multi-Family Residential	12	$715	$8,600
Commercial/Retail	4	$130	$22,600
Office	2	$130	$11,300
Warehouse	0	$150	$0
Industrial	1	$150	$13,100
Public/Institutional	1	$95	$8,300
Total	**50**	**-**	**$83,000**

3.4.3 Parks Impact Fees

To pay for park impacts created by development growth demand, i.e., upgrades to Schey Park and the cost of a new 8 acre park, for a total capital need of $1,010,000, an average of $2,130 would be required per residential building permit. This is allocated to single-family dwellings and multi-family dwellings, as shown in Table 3-8, based on average household size.

Table 3-8 Parks Impact Fee for Residential Land Uses

Land Use Type	Estimated Permits[1]	Parks Fee, per unit	Capital Raised by 2035 (2017 $)
Single Family Residential	403	$2,215	$892,600
Multi-Family Residential	71	$1,660	$117,900
Total	**474**	**-**	**$1,010,500**

[1]15% of residences are assumed to be multi-family units; multi-family lots are assumed to have 5 units per lot.

3.4.4 Town Hall Impact Fees

Development growth is estimated to provide approximately 55% of the demand for community services housed in a new town hall, with a total project cost allocated to development of $742,500. For this portion of the new town hall cost, an average of $1,490 would have to be charged per building permit. However, a multiplier of 0.75 is applied to multi-family units to account for generally smaller per-unit demand for community services in the new town hall. Table 3-9 lists the recommended town hall impact fees for by land use type.

Table 3-9 Town Hall Impact Fee by Land Use Type

Land Use Type	Estimated Permits[1]	New Town Hall Fee[2]	Capital Raised by 2035 (2017 $)
Single Family Residential	403	$1,545	$622,635
Multi-Family Residential	71	$1,160	$82,360
Commercial/Retail	12	$1,545	$18,540
Office	3	$1,545	$4,635
Warehouse	1	$1,545	$1,545
Industrial	6	$1,545	$9,270
Public/Institutional	2	$1,545	$3,090
Total	**498**	**-**	**$742,075**

[1]15% of residences are assumed to be multi-family units.
[2]Fees for the new town hall are per unit or per lot.

3.4.5 Police Service Facility Impact Fees

Similarly, growth is expected to pay for 55% of facility upgrades for the growth in police services, requiring capital project funds of approximately $220,000 to be allocated to development growth. Using the functional populations as described above, and estimating the number of permits that will be obtained, the impact fees for police services housed in community facilities are allocated by land use type as listed in Table 3-10. The Police Service Facility fee for non-residential uses will be applied based on each 1,000 square feet of building area.

Table 3-10 Police Services Facility Impact Fee by Land Use Type

Land Use Type	Estimated Permits[1]	Police Service Facility Impact Fee	Capital Raised by 2035 (2017 $)
Single Family Residential	403	$195 per lot	$78,585
Multi-Family Residential	71	$150 per unit	$10,650
Commercial/Retail	12	$805 per 1,000 sf	$94,668
Office	3	$305 per 1,000 sf	$14,915
Warehouse	1	$45 per 1,000 sf	$2,354
Industrial	6	$100 per 1,000 sf	$10,440
Public/Institutional	2	$240 per 1,000 sf	$8,352
Total	**498**	**-**	**$219,964**

[1]15% of residences are assumed to be multi-family units.

3.5 Comparison to Similar Communities

The recommended Town of Keenesburg impact fees for these five impact categories for a single family building permit total $6,480. To benchmark the Town's recommended impact fees against comparison communities, single family impact fees for eleven communities similar in size and/or location were researched. The total amount of impact fees required by these eleven communities using best available information is listed in Table 3-11. Readily available information is not always accurate, fees may be changed at any time, and some judgment in interpreting fees is exercised. Therefore, these fees may not precisely reflect actual fees imposed by these communities. However, the listed fees are appropriate for comparison purposes.

Table 3-11 Impact Fees Established by Comparison Communities

Comparison Community	Impact Fees for Single Family Home
Milliken	$4,061
Hudson	$4,454
Fort Lupton	$5,033
Frederick	$6,083
Castle Rock	$7,765
Greeley	$8,039
Dacono	$8,306
Platteville	$8,707
Brighton	$9,180
Firestone	$11,398
Erie	$13,461

The range of impact fees for these eleven similar communities is approximately $4,000 to $13,500, with a mean of $7,895. Keenesburg's recommended impact fees, at $6,480, sits below the mean, and is lower than seven of the eleven communities.

However, the "impact" of impact fees upon development growth must be considered along with water and sewer tap fees and the raw water acquisition fee to understand the complete cost of building permit fees. Water and sewer tap fees and the cost for raw water acquisition are evaluated below.

4.0 WATER AND SEWER TAP FEES

4.1 Approach

An approach similar to that used in calculating impact fees was used to determine the level of water and sewer tap fees required to meet the demand placed upon Town water and wastewater infrastructure by development growth:

1. Specific capital projects are identified as required to provide water and wastewater services required by development growth and the estimated cost of those capital projects was estimated.
2. The percent of the capital improvements that are expected to result from the demands of development growth are estimated.
3. Tap fees are estimated such that sufficient revenue would be generated to fund the needed capital improvements.

4.2 Water and Wastewater Capital Improvements Plan

Upgrades to the water distribution system will be needed to support new development. Because a water main size upgrade or additions of water mains would be directly related to growth, growth would be paying 100% of the cost. While the exact areas of the distribution system that would need upgrades are not currently known, the capital cost are estimated based on the assumption that 1.5 miles of new pipeline would be built at a cost of $240 per linear foot. This unit rate is based on Keenesburg's realized 2016 experience for full replacement of existing asbestos cement water pipe.

Additionally, the Town's water treatment system will require expansion to meet the additional capacity required by new development. Expansion to the current water treatment system is estimated to cost $500,000. Water quality upgrades will also be required to meet potable water demands of development growth. These water quality system upgrades are estimated at approximately $540,000, assuming an additional $3 per gallon per day of treatment cost for 180,000 gallons per day of water demand (130 gallons per capita per day times 1,375 new persons). Development growth would be paying for 100% of these water treatment system expansion and upgrades.

Assuming 4% growth, the current wastewater treatment plant is anticipated to reach 80% of its capacity in 2027 and a new plant would be needed soon thereafter. The need for a new plant based on capacity is fully contributed to growth. However, Colorado regulations will require stricter nitrogen and phosphorus requirements, which could only be met with a new plant. Therefore, the existing Town's population should also contribute to the cost of the new plant. The new plant is estimated to be designed with a 600,000 gallons per day (gpd) capacity and at an assumed cost of $8.50 per gallon. This per-gallon treatment cost is based on the experience of Bennett, Colorado and its proposed wastewater treatment facility and based on published cost data (Means, 2016). The percentage that growth would be paying for this improvement is based on the 55 percent of the population that growth will comprise in the year 2035.

It is assumed that the developer would be responsible for paying the cost of new water distribution lines and sewer collection mains within the subdivision or area being developed. If a new line is needed to connect a satellite system to the town, the developer would be responsible for construction of the line. It is expected that the Town and the developer would work out a re-pay agreement so that if a second satellite system connected to the main originally paid for by the developer, the second developer would re-pay the first for their proportionate share of the infrastructure.

Table 4-1 lists the recommended capital water and wastewater projects to be completed by 2035 to meet the needs of development growth.

Table 4-1 Water and Wastewater CIP

Project	Estimated Cost	% Attributed to Growth	Estimated Share
New trunk pipelines	$1,900,800	100%	$1,900,800
New water treatment plant or expansion	$1,040,000	100%	$1,040,000
New wastewater treatment plant	$5,100,000	55%	$2,805,000
Total	**$8,040,800**	**-**	**$5,745,800**

4.3 Recommended Tap Fees

Water Tap Fee

The water tap fee will provide funds for needed plant investment as described above to meet the needs of development growth. The recommended amount of this fee is $5,955 per building permit for a 3/4" water tap. This amount is then scaled up based on the water tap size, as shown in Table 4-2. Note that a multiplier of 0.6 is used in calculating a multi-family unit's tap fee from the single family tap fee. The detail underlying the estimate of required tap fee is provided in spreadsheets attached in Appendix A.

Table 4-2 Recommended Water Tap Fees

Water Tap Size	Water Tap Fee
Multi-Family, per unit	$3,575
Residential, 3/4"	$5,955
Residential, 1”	$10,125
Residential, 1-1/2”	$20,845
Residential, 2”	$35,730
Residential, >2”	TBD
Commercial, 3/4”	$5,955
Commercial, 1”	$10,125
Commercial, 1-1/2”	$20,845
Commercial 2”	$35,730
Commercial, >2”	TBD

There is not a clear difference in water demand between residential and non-residential water use of the same tap size; therefore, the fee will be the same for either land use category for the same tap size.

Raw Water Acquisition Fee

Keenesburg requires that annexations dedicate the underlying groundwater to the Town. The true cost of this raw water, however, includes the cost to drill wells, install pump stations, and pipe the water to a central gathering location where the raw water can be treated. Telesto estimates those raw water development costs to determine a recommended raw water acquisition fee. Calculations, provided in Appendix C, indicate that the Town’s raw water acquisition fee should be approximately $10,200 for a ¾” water tap. This is based on a calculated average of 130 gpcd, 2.91 persons per household, and an approximate 50% planning factor to account for system losses and raw water supply vulnerability. The raw water acquisition fee by tap size is listed in Table 4-3.

Table 4-3 Raw Water Acquisition Fee (Water Development Fee)

Water Tap Size	Raw Water Acquisition/Development
Multi-Family, per unit	$6,120
3/4"	$10,200
1”	$17,340
1-1/2”	$35,700
2”	$61,200
>2”	TBD

Sewer Tap Fee

As with the water tap fee, the sewer tap fee will provide funds for needed plant investment as described above to meet the needs of development growth. The recommended amount of the sewer tap fee is correlated to the required water tap size because the demand for wastewater treatment is correlated with the amount of water demanded. For a ¾" water tap the sewer tap fee would be $5,680 per single family building permit. This amount is then scaled up according to water tap size, as shown in Table 4-3. Note that the same multiplier of 0.6 was used in calculating a multi-family unit's sewer tap fee from the single family sewer tap fee. The detail underlying the estimate of required tap fee is provided in spreadsheets attached in Appendix A.

Table 4-4 Recommended Sewer Tap Fees

Water Tap Size	Sewer Tap Fee
Multi-Family, per unit	$3,410
3/4"	$5,680
1"	$9,655
1-1/2"	$19,880
2"	$34,080
>2"	TBD

4.4 Comparison to Other Communities

The current single family water and sewer tap fees imposed by the Town total $14,500 and the new recommended single family water and sewer tap fees total $11,635. To benchmark the Town's recommended tap fees against comparison communities, single family tap fees for eleven communities similar in size and/or location were researched, using best available information. Where towns are located within water or sanitation districts, the tap fees applied by both the town and the district were added. The water and sewer tap fees required by these eleven communities are listed in Table 4-5.

Table 4-5 Tap Fees Established by Comparison Communities

Comparison Community	¾" (or 5/8" if available) Water Tap Fee	¾" Sewer Tap Fee	Total Tap Fees
Platteville	$1,294	$1,439	$2,733
Castle Rock	$2,220	$2,303	$4,523
Hudson	$2,726	$3,408	$6,134
Fort Lupton	$5,750	$3,041	$8,791
Brighton	$10,640	$2,175	$12,815
Milliken	$11,819	$4,177	$15,996
Greeley	$10,800	$5,450	$16,250
Dacono	$11,000	$5,650	$16,650
Frederick	$12,100	$5,650	$17,750
Erie	$12,748	$5,200	$17,948
Firestone	$13,844	$5,650	$19,494

As can be seen in the table above, the range of total tap fees for these eleven similar communities is approximately $2,700 to $19,500, with a mean of approximately $14,750. Keenesburg's recommended combined tap fees, at $11,635, sit below the mean, and are lower than seven of the eleven communities.

Table 4-6 provides a comparison of all single family development fees, not including use tax and incidental permit fees, for the Town and the eleven comparison communities, using best available information. Readily available information is not always accurate, fees may be changed at any time, and some judgment in interpreting fees is exercised. Therefore, these fees may not precisely reflect actual fees imposed by these communities. However, the listed fees are appropriate for comparison purposes. Keenesburg's recommended total development fees, including impact fees, tap fees, and raw water acquisition, which total $28,315, are lower than nine of the eleven communities.

Table 4-6 Development Fees for Comparison Communities

Comparison Community	Impact Fees	Tap Fees	Raw Water Acquisition Fee	Total Development Fees
Castle Rock	$7,765	$4,523	$10,216	$22,504
Hudson	$4,454	$6,134	$15,000	$25,588
Keenesburg	***$6,480***	***$11,635***	***$10,200***	***$28,315***
Platteville	$8,707	$2,733	$18,500[1]	$29,940
Brighton	$9,180	$12,815	$9,610	$31,605
Fort Lupton	$5,033	$8,791	$18,500[1]	$32,324
Milliken	$4,061	$15,996	$21,433	$41,490
Dacono	$8,306	$16,650	$18,500[1]	$43,456
Greeley	$8,039	$16,250	$20,400	$44,689
Frederick	$6,083	$17,750	$22,000	$45,833
Erie	$13,461	$17,948	$15,300	$46,709
Firestone	$11,398	$19,494	$18,500[1]	$49,392

[1]Platteville, Firestone, Fort Lupton, and Dacono currently require 1 Colorado-Big Thompson (CBT) unit; the raw water acquisition fee is dependent upon the market price of 1 CBT unit and is estimated here based on current Central Weld County Water District published values for a 5/8" tap.

5.0 CONCLUSION

The projected capital necessary to fund the Town services directly required by development growth, and the estimated capital raised by recommended impact and tap fees, by land use type, are summarized in Table 5-1. Recommended residential impact and tap fees are projected to raise 86% of the capital infrastructure required by development growth, with non-residential impact and tap fees to provide the remaining 14%.

Table 5-1 Total Revenue Potential from Impact Fees/PIFs in 2017 Dollars

Land Use	Capital Required (2017 $)	Capital Raised, Residential Fees (2017 $)	Capital Raised, Non-Residential Fees (2017 $)
Impact Fees			
Roadway Fees	$1,420,300	$869,200	$549,900
Drainage Fees	$83,000	$27,200	$55,300
Park Fees	$1,010,000	$1,010,500	$0
Town Hall Fees	$742,500	$704,995	$37,080
Police Fees	$220,000	$89,235	$130,728
Subtotal	$3,475,800	$2,701,100	$773,000
Tap Fees			
Water Tap Fees	$2,940,800	$2,653,500	$286,400
Sewer Tap Fees	$2,805,000	$2,531,000	$273,200
Subtotal	$5,745,800	$5,184,500	$559,600
Total	**$9,221,600**	**$7,885,600**	**$1,332,600**

A summary of recommended impact fees by land use type for the five fee categories evaluated in this report is provided in Table 5-2.

Table 5-2 Recommended Impact Fees

Land Use	Roadways Impact Fee	Drainage Impact Fee	Parks Impact Fee	New Town Hall Impact Fee, per lot	Police Impact Fee
Single Family Residential, per lot	$1,905	$0.175[2]	$2,215	$1,545	$195
Multi-Family Residential, per unit	$1,430	$0.175[2]	$1,660	$1,160	$150
Commercial/ Retail	$1,705[1]	$0.175[2]	-	$1,545	$805[1]
Office	$3,115[1]	$0.175[2]	-	$1,545	$305[1]
Warehouse	$970[1]	$0.175[2]	-	$1,545	$45[1]
Industrial,	$485[1]	$0.175[2]	-	$1,545	$100[1]
Institutional	$2,750[1]	$0.175[2]	-	$1,545	$240[1]

[1]Fee calculated based on each 1,000 square feet of building area.
[2]Drainage impact fees will only be assessed in the Park and Ash Hollow Drainage Basins (see Figure 2 and Appendix B) when on-site detention is not provided. Drainage impact fees for all development permits will be assessed on the basis of each square foot of impervious area.

A summary of recommended water and sewer tap fees by land use type is provided in Table 5-3.

Table 5-3 Recommended Tap Fees

Tap Size	Water Tap Fee	Sewer Tap Fee
¾” Multi-Family	$3,575	$3,410
¾” Single Family/Commercial	$5,955	$5,680
1” Single Family/Commercial	$10,125	$9,655
1-1/2” Single Family/Commercial	$20,845	$19,880
2” Single Family/Commercial	$35,730	$34,080
>2” Single Family/Commercial	TBD	TBD

The impact and tap fees recommended above are estimated as the minimum fees required to fund capital infrastructure projects directly benefiting development growth. These fees are calculated based on appropriate engineering approximations and assumptions. To account for differences in actual conditions relative to those conditions forecasted, approximated, and assumed herein, we recommend that impact fees and tap fees be periodically re-evaluated and adjusted as necessary.

The recommended raw water acquisition fee, required to develop the groundwater resources owned by the Town, is $10,200 per single family residential tap equivalent.

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Appendix A
Detail for Estimation of Impact and Tap Fees

Table A-1 Estimated Number of Permits

Type	Estimated Number of Units
Commercial/Retail	12
Office	3
Warehouse	1
Industrial	6
Public/Institutional	2
Single-Family, Detached	403
Multi-Family[1]	71
TOTAL	**498**

[1]Assume that 15% of residences are multi-family units

Table A-2 Residential Functional Population

Type	Average HH Size	Occupancy	Func. Pop./unit
Single-Family	2.91	0.58	1.69
Multi-Family	2.18	0.58	1.27

Table A-3 Non-Residential Functional Population Per 1,000 Sq. Ft. of Building

Type	Mean Sq. Ft./Employee	Employee per 1000 sq. f[t1]	Town Population	Person Trips/Day	Total Trips/Day	Mean sq. ft./building	Daily trips/1000 sq. ft.	Visitors/1000 sq. ft[1]	Func. Pop./1000 sq. ft.
Commercial/Retail	1243	0.80	2619	0.6	1571.4	9800	160.35	159.54	6.92
Office	473	2.11	2619	0.3	785.7	16300	48.20	46.09	2.63
Warehouse	1843	0.54	2619	0.1	261.9	52300	5.01	4.47	0.37
Industrial	1193	0.84	2619	0.1	261.9	17400	15.05	14.21	0.87
Public/Institutional	1716	0.58	2619	0.30	785.7	17400	45.16	44.57	2.05

[1]Assume that each employee spends 8 hours a day at work and the average visit time of a visitor is 1 hour

Table A-4 Town Hall/Community Center Fee Per Unit

Type	Town Hall Fee Ratio	Town Hall Fee	Town Hall Funds
Commercial/Retail	1	$1,545	$18,540
Office	1	$1,545	$4,635
Warehouse	1	$1,545	$1,545
Industrial	1	$1,545	$9,270
Public/Institutional	1	$1,545	$3,090
Single-Family, Detached	1	$1,545	$622,635
Multi-Family	0.75	$1,160	$82,360
TOTAL	-	-	**$742,075**

Table A-5 Police Fee Per 1,000 Sq. Ft. of Building or Per Residential Unit

Type	Func. Pop./1000 sq. ft. or Unit	Mean sq. ft./building	Police Fee	Police Funds
Commercial/Retail	6.92	9800	$805	$94,668
Office	2.63	16300	$305	$14,915
Warehouse	0.37	52300	$45	$2,354
Industrial	0.87	17400	$100	$10,440
Public/Institutional	2.05	17400	$240	$8,352
Single-Family, Detached	1.69	-	$195	$78,585
Multi-Family	1.27	-	$150	$10,650
TOTAL	-	-	-	**$219,963**

Table A-6 Streets Fee By Land Use Type Based on Vehicle Trips Per Day Per 1000 Sq. Ft. of Building of Residential Unit

Type	Growth	Trips/Day per person	Total Person Trips/Day	Mean building size (sf)	Daily person trips/1000 sq. ft.	Persons per Vehicle	Daily Vehicle Trips per 1000 sq. ft. or residential unit	Streets Fee	Streets Funds
Commercial/Retail	1375	0.6	825.0	9800	7.02	1.75	4.01	$1,705	$200,508
Office	1375	0.3	412.5	16300	8.44	1.15	7.34	$3,115	$152,324
Warehouse	1375	0.1	137.5	52300	2.63	1.15	2.29	$970	$50,731
Industrial	1375	0.1	137.5	17400	1.32	1.15	1.15	$485	$50,634
Public/Institutional	1375	0.3	412.5	17400	11.85	1.83	6.48	$2,750	$95,700
Residential	1375	2.4	3300.0	N/A	N/A	1.61	4.32	$1,835	$869,790
TOTAL	-	-	**5225**	-	-	-	-	-	**$1,419,687**

Table A-7 Residential Streets Fee By Type of Residential Unit

Type	Fee	Number of Permits	Streets Funds
Single-Family, Detached	$1,905	403	$767,715
Multi-Family	$1,430	71	$101,530
TOTAL	-	-	**$869,245**

Table A-8 Residential Parks Fee Per Unit

Type	Average HH Size	Number of Units	Parks Fee	Parks Funds
Single-Family, Detached	2.91	403	$2,215	$892,645
Multi-Family	2.18	71	$1,660	$117,860
TOTAL	-	-	-	**$1,010,505**

Table A-9 Drainage Fee for Development within Drainage Basins Per 1000 Sq. Ft. of Lot

Type	Estimated Permits	Percent Impervious	Lot or Unit Size (Sq. Ft.)	Impervious Area Per Lot or Unit (Sq. Ft.)	Estimated Impervious Area (Sq. Ft.)	Estimated Average Impact Fee Per Permit[1]	Drainage Fee Funds
Commercial/Retail	4	75%	43,560	32670	130680	$130	$22,651
Office	2	75%	43,560	32670	65340	$130	$11,326
Warehouse	0	85%	87,120	74052	0	-	-
Industrial	1	85%	87,120	74052	74052	$150	$13,068
Public/Institutional	1	55%	87,120	47916	47916	$95	$8,276
Single-Family, Detached	30	45%	7,851	3532.95	105988.5	$620	$18,600
Multi-Family	12	75%	5,445	4083.75	49005	$715	$8,580
TOTAL	**50**	**-**	**-**	**-**	**472981.5**	-	**$82,501**

[1]The drainage funds needed divided by the total estimated impervious area yields approximately $0.175 per square foot of impervious area

Table A-10 Water Tap Fee

Type	3/4" Tap	1" Tap	1-1/2" Tap	3/4" Tap Fee	1" Tap Fee	1-1/2" Tap Fee	Total Capital
Commercial/Retail	3	7	2	$5,955	$10,124	$20,843	$130,415
Office	1	2	0	$5,955	$10,124	$20,843	$26,202
Warehouse	0	0	1	$5,955	$10,124	$20,843	$20,843
Industrial	1	3	2	$5,955	$10,124	$20,843	$78,011
Public/Institutional	0	1	1	$5,955	$10,124	$20,843	$30,966
Single-Family, Detached	403	0	0	$5,955	$10,124	$20,843	$2,399,865
Multi-Family	71	0	0	$3,573	$10,124	$20,843	$253,683
TOTAL	**-**	**-**	**-**	**-**	**-**	-	**$2,939,984**

Table A-11 Sewer Tap Fee

Type	3/4" Tap	1" Tap	1-1/2" Tap	3/4" Tap Fee	1" Tap Fee	1-1/2" Tap Fee	Total Capital
Commercial/Retail	3	7	2	$5,680	$9,656	$19,880	$124,392
Office	1	2	0	$5,680	$9,656	$19,880	$24,992
Warehouse	0	0	1	$5,680	$9,656	$19,880	$19,880
Industrial	1	3	2	$5,680	$9,656	$19,880	$74,408
Public/Institutional	0	1	1	$5,680	$9,656	$19,880	$29,536
Single-Family, Detached	403	0	0	$5,680	$9,656	$19,880	$2,289,040
Multi-Family	71	0	0	$3,408	$9,656	$19,880	$241,968
TOTAL	**50**	**-**	**-**	**-**	**-**	-	**$2,804,216**

Appendix B
Table of Street/Address Locations in Town Drainage Basins

Table B-1. Drainage Impact Fee: Basins/Streets Table

Streets/Addresses Located in Park Basin	
Street Name	**Address Numbers**
N. Cedar Street	90 through 190 N. Cedar Street
N. Pine Street	10 through 95 N. Pine Street
W. Highway 2	All addresses
S. Elm Street	All addresses
W. Gandy Avenue	All addresses
E. Gandy Avenue	65 through 70 E. Gandy Avenue
W. Crawford Avenue	All addresses
S. Cedar Street	All addresses
S. Pine Street	All addresses
W. Owen Avenue	All addresses
W. Morgan Avenue	All addresses
W. Nelson Avenue	All addresses
W. Shepard Avenue	All addresses
S. Main Street	200 through 480 S. Main Street
E. Crawford Avenue	35 through 75 E. Crawford Avenue
E. Owen Avenue	10 through 120 E. Owen Avenue
E. Morgan Avenue	60 through 120 E. Morgan Avenue
S. Ash Street	310 through 380 S. Ash Street
Streets/Addresses Located in Ash Hollow Basin	
Street Name	**Address Numbers**
N. Cedar Street	320 through 370 N. Cedar Street
N. Market Street	All addresses
N. Ash Street	All addresses

Streets/Addresses Located in Ash Hollow Basin	
Street Name	**Address Numbers**
N. Main Street	All addresses
N. 1st Avenue	All addresses
E. Broadway	All addresses
E. Highway 2	All addresses
E. Kiser Avenue	All addresses
E. Kipp Avenue	All addresses
Johnson Circle	All addresses
N. Johnson Street	All addresses
N. Miller Street	All addresses
N. Stewart Street	All addresses
E. Woodward Avenue	All addresses
S. Main Street	10 through 190 S. Main Street
E. Gandy Avenue	190 through 290 E. Gandy Avenue
S. Ash Street	15 through 295 S. Ash Street
S. Stewart Street	All addresses
E. Joshua Avenue	All addresses
S. Lambert Street	All addresses
E. Lambert Court	All addresses
S. Dickson Street	All addresses
Weld County Road 59	All addresses

Appendix C
Estimation of Raw Water Acquisition (Water Development) Fee

TELESTO SOLUTIONS • INCORPORATED

Job No.: 801100-014 Client: Town of Keenesburg Page 1 of 4

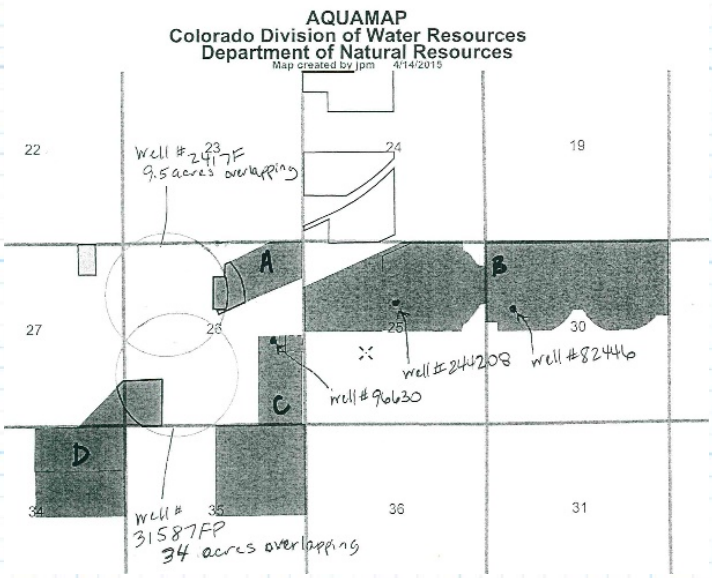
Task: Impact Fees Study Computed By: K. Bruxvoort Date: 12/05/16

GW development cost Checked By: T. Tigges Date: 12/06/16

Problem Statement:

Calculation Documentation

The Town of Keenesburg received a Findings and Order (Order) from the Colorado Ground Water Commission, recorded on June 30, 2015. The Order stipulated a groundwater right for the Town to withdraw from the Laramie-Fox Hills aquifer an average annual amount of 192.7 acre-feet corresponding to four overlying land areas. The four land areas total 1093 acres, and are identified as Areas A through D in the figure below. The cost to develop this groundwater right will be estimated with this calculation.



Objectives:

1. Estimate the cost to develop the 192.7 AF of groundwater right held by the Town of Keenesburg. These quantity is added to other rights totaling 644 AF.
2. Meet the criteria for including the corresponding water development fee as part of a development Impact Fees Study

Approach:

1. Consider 2 alternatives to pump, pipe, and treat the subject groundwater for use in the Town's potable water distribution system
2. At a conceptual level, estimate the cost of the infrastructure required to develop the groundwater resource for each of the 2 alternatives

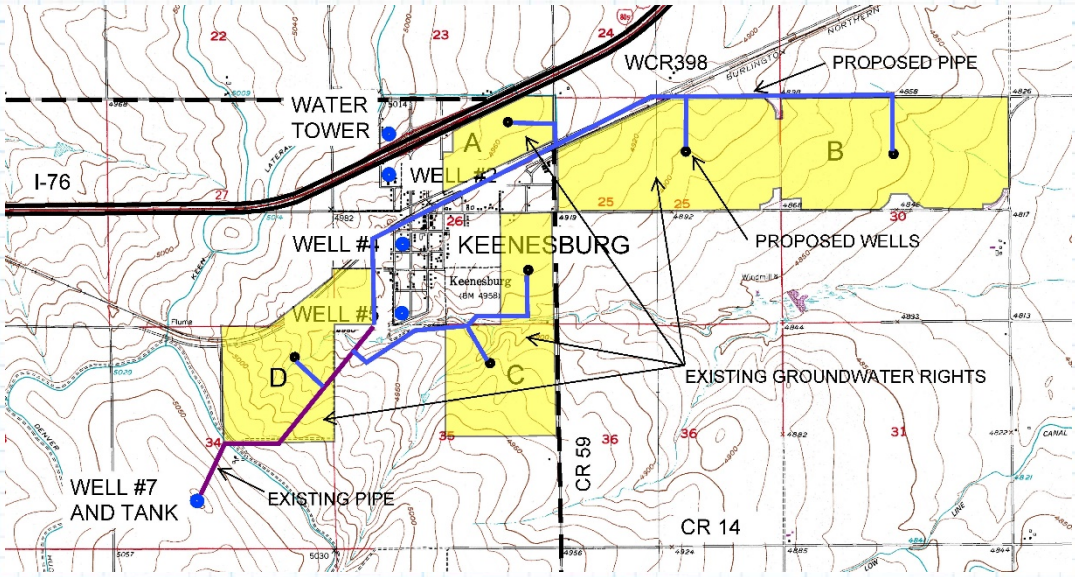
Data and Assumptions:

1. The cost to develop the resources can be considered a reasonable estimate of the value of the resource
2. Use the Order conditions to define the location and limitations of the groundwater resources
3. Use recent Town experience for pipeline costs
4. Use a contingency of 15%
5. Cost estimation assumptions are listed in the calculations below

Data and Assumptions (continued):

Area ID	Area (acres)	Groundwater Volume (AF)	Pumping Rate (gpm)
A	82.2	14.7	9
B	569.1	101	63
C	235.5	39.5	25
D	206.2	37.5	23
Totals	1093.0	192.7	119

Option 1 Description: Drill 6 groundwater withdrawal wells to tap the underlying resource. Pump the water to the west central portion of Town to connect to an existing pipe, which conveys water to the existing blending station near Well 7. See map below.



Calculations:

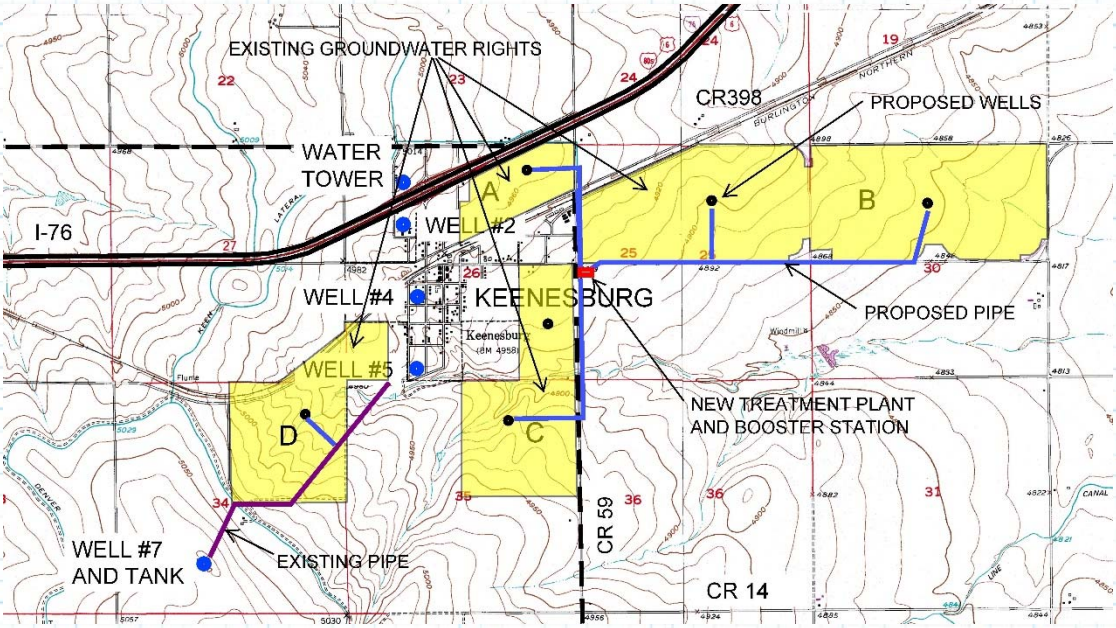
1. See attached table for estimated cost of wells and pipes.
2. Well development costs are estimated from similar Telesto experience, where overall well installation costs vary from $90 to $100/LF under similar conditions.
3. Unit costs for pipelines are based on Town experience with the CR59 waterline and AC pipe replacement projects. Use $55/LF for pipeline costs in open land. Use $180/LF for pipeline costs immediately adjacent to the existing CR 398. The higher unit cost is due to anticipated utility conflicts, boring costs, repaving costs, and traffic control.

Cost estimate for Option 1:

Option 1 - pipe and pump to existing blending station

	Conceptual Cost Estimate			Engineer's Estimate	
Item	**Description**	**Quantity**	**Units**	**Unit Price**	**Total**
1	Drill 6 wells, 900' each	5,400	LF	100	$540,000
2	Well infrastructure	6	EA	50000	$300,000
3	Pipeline, field, 3.2 miles	18,500	LF	55	1,017,500
4	Pipeline, next to CR398	7,000	LF	180	1,260,000
5	Contingency	1	EA	15%	422,625
	Total				$3,540,125

Option 2 Description: Drill 6 groundwater withdrawal wells to tap the underlying resource. Pump the water to the east central portion of Town to connect to a new treatment facility. This facility would include chlorine treatment, storage tank and booster pumps. Treated water would be connected to the existing distribution network at that location. See map below.



Calculations:

1. See attached table for estimated cost of wells and pipes.
2. Well development costs are estimated from similar Telesto experience.
3. Unit costs for pipelines are based on Town experience with the CR59 waterline and AC pipe replacement projects. Use $65/LF for pipe adjacent to CR59 in Option 2. This location for pipe placement is considered significantly more advantageous than along CR398.

Cost estimate for Option 2:

Option 2 - pipe and pump to new blending station

	Conceptual Cost Estimate			Engineer's Estimate	
Item	Description	Quantity	Units	Unit Price	Total
1	Drill 6 wells, 900' each	5,400	LF	100	$540,000
2	Well infrastructure	6	EA	50000	$300,000
3	Pipeline, field, 2.8 miles	15,000	LF	55	825,000
4	Pipeline, next to CR59	5,500	LF	65	357,500
5	New treatment & booster pumps	1	EA	500000	500,000
6	New water tank	1	EA	350000	350,000
7	Contingency	1	EA	15%	385,875
	Total				$3,258,375

Results:

The two alternatives yield similar estimates of cost at a conceptual level. Option 1, which would involve piping groundwater through the Town to its western edge, is estimated to cost more, at approximately $3,500,000. Option 2, which would include a new treatment plant, storage tank and booster pumps on the east side of Town, is estimated to cost approximately $3,300,000. Thus, the cost to develop the 192.7 acre-feet of groundwater by these means is estimated to be approximately $16,900 to $18,400 per acre-foot.

Discussion and Recommendations:

The first option requires piping the groundwater through Town, from where it could connect to an existing pipeline, and then to the existing blending station and water tanks. This option, at a conceptual level, is estimated to be slightly more costly than the second option due to the higher cost of piping the water along CR398. However, this option takes advantage of existing treatment and storage infrastructure, and would likely be somewhat cheaper to operate. The second option is estimated to be about 10% less expensive than the first, and would provide some system redundancy, but at a higher annual operating cost.

Conclusions:

The estimated cost to develop the 192.7 acre-feet of groundwater resource designated by the Order of the Colorado Ground Water Commission for municipal use was estimated to be $16,900 to $18,400 per acre-foot. The resource development cost would include the cost to drill extraction wells, and then route the water to a plant for treatment and temporary storage. Population growth leading to new land development within the Town would require these groundwater resources, and the cost to develop these resources may be recovered with a water development fee (or raw water acquisition fee). For SF residence, at 130 gpcd and 2.91 persons per household, water use = 378 gpd = 0.4 ac-ft/year. For municipal use calculation, assume 50% planning factor to account for system losses and water supply vulnerability = 0.6 AF/year per household. Water development cost = $16,900/AF x 0.6 AF/year = $10,200 for a SF residence. Apply a multiplier of 0.6 for MF units. Scale upward for larger taps, using a multipliers of 1.7, 3.5, and 6.0 for 1", 1-1/2", and 2" taps respectively.