PACTS Planning Committee Meeting
AGENDA
Thursday, February 6, 2020
9:00 AM -10:30 AM
GPCOG Conference Rooms, 2nd Floor, 970 Baxter Blvd, Portland

1. Welcome- Alex Jaegerman, Chairman

2. Acceptance of 11/7/19 Minutes (Attachment A)

3. Public Comments
   The general public will have an open comment period with a 3-minute limit per individual to comment on any issue, including items on the agenda.

4. Motion to Replace Jay Chace as Vice Chair of the Committee—3 min.
   Jay Chace will step down as Vice Chair of the Planning Committee to join the PACTS Policy Committee. The Committee will set a motion and vote for a replacement for Jay Chace as the Vice Chair of the Planning Committee.

   Recommended Action: Approve a new Vice Chair for the Planning Committee.

5. 2020 Committee Goals and Meeting Schedule Review—10 min. (Attachment B)
   The PACTS Planning Committee developed a draft mission in 2018 identifying its primary responsibilities as tracking progress on long range planning, providing input and feedback on current planning projects, and participating on the development of the PACTS UPWP and TIP. Staff was directed to work with the chair to identify specific projects and tasks for the committee to pursue moving forward.

   GPCOG staff has developed a 2020/21 meeting schedule and project list for the PACTS Planning committee to review and discuss. Specifically, the committee will discuss its goals and priorities for the coming year.

   Future meetings will be quarterly, with the addition of two joint meetings with Tech and Transit Committees. Additional meetings will be added if needed.

   Recommended Action: Endorse a meeting schedule and discuss committee goals for the upcoming year.

6. South Portland Mill Creek to Cushing’s Point Priority Corridor Study. Project Update—10 min. (Attachment C)
The South Portland Mill Creek to Cushing’s Point Priority Corridor Study will address existing transportation deficiencies between the Casco Bay Bridge and Cushing’s Point in South Portland, and improvements needed to accommodate significant new development in the Cushing’s Point/Spring Point area. This study will consider and propose several specific ways of increasing capacity in an environment where road widening is not an option, including increased transit service, improved traffic signal operations, and marine transportation to and from Portland. South Portland will provide a brief update on the current status and next steps for this project.

**Recommended Action: For information only.**

7. **Transportation Improvement Plan (TIP) Ad Hoc Committee Update—20 min.**

The TIP Ad Hoc Committee is an advisory committee that will serve an important roll in the current UPWP: developing a funding framework to select projects for funding in the Transportation Improvement Plan. This funding framework will be used to prioritize projects of all modes.

Aubrey Miller will present on the TIP Ad Hoc Committee’s task to update policies and procedures and the process by which transit projects are reviewed and funded by this committee. Following the presentation, Aubrey will provide a staff update on the progress of the establishment of the committee.

The RFP for the transit funding prioritization framework can be found here: [https://www.gpcog.org/DocumentCenter/View/902/RFP_FundingPrioritization_Final-PDF?bidId=3](https://www.gpcog.org/DocumentCenter/View/902/RFP_FundingPrioritization_Final-PDF?bidId=3)

**Recommended Action: For information only.**

8. **Maine Climate Council Transportation Working Group Presentation with Kristina Egan—30 min.**

Kristina Egan will present and update on the Maine Climate Council’s directive to reduce transportation related greenhouse gas emissions and provide an update on the following goals of the Maine Climate Council Transportation Working Group:

*Bold emissions reductions:* The Maine Climate Council is charged with developing a plan to meet state greenhouse gas emissions reduction targets that are now in law, including a gross 45% greenhouse gas emissions reduction below 1990 levels by 2030 and at least 80% by 2050.

*Mitigation:* Develop mitigation strategies to meet state emissions reduction requirements in all sectors of the economy, with a focus on Maine’s transportation, electricity, and buildings sectors.

**Recommended Action: For information only.**

9. **Planning Committee Role in Long-Range Plan —15 min. (Attachment D)**

Building on Kristina’s presentation on the Maine Climate Council’s Transportation Working Group, the committee will discuss its role in the development of a scope for the next update of Destination 2040, the PACTS Long Range transportation Plan. The committee will discuss drafting a charge for itself for PACTS Executive Committee consideration. The charge could include tasking the Planning committee with assessing progress in implementing the previous long-range plan and outlining the elements of the next
long-range plan. The next long-range plan could include recommendations about how PACTS can contribute to reaching the state’s climate emissions reductions goals and how the region can prepare for the stresses and acute events from a changing climate. The charge will be presented to the PACTS Executive meeting at their March Meeting.

*Recommended Action: Recommend that the Executive Committee charge the Planning Committee with assessing progress on Destination 2040 and developing the elements of the next long-range plan.*

9. **Adjourn.**
In attendance:

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Alex Jaegerman, Chair</td>
<td>Yarmouth</td>
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<tr>
<td>Michael Foster</td>
<td>Old Orchard Beach</td>
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<tr>
<td>Adam Bliss</td>
<td>Freeport</td>
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<tr>
<td>Amanda Lessard</td>
<td>Windham</td>
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<tr>
<td>Justin Barker</td>
<td>South Portland</td>
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<td>Tex Haeuser</td>
<td>South Portland</td>
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<tr>
<td>Bruce Hyman</td>
<td>Portland</td>
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<td>Jay Chace</td>
<td>Scarborough</td>
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<td>Maureen O’Meara</td>
<td>Cape Elizabeth</td>
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<td>Emily Prescott</td>
<td>Saco</td>
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<td>Art Handman</td>
<td>South Portland</td>
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<td>Kara Wooldrik</td>
<td>Portland Trails</td>
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<td>Chris Mann</td>
<td>MaineDOT</td>
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Staff:

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<th>Name</th>
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<tbody>
<tr>
<td>Steph Carver</td>
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<tr>
<td>Sara Zografos</td>
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<td>Harold Spetla</td>
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1. **Welcome/Introductions/Sign-In – Alex Jaegerman, Chair**
   Alex opened the meeting at 9:00 a.m.

2. **Public Comment**
   There was no public comment.

3. **Acceptance of 05/02/2019 Minutes**
   The 05/02/2019 minutes were accepted unanimously with no discussion.
4. **PACTS Planning Study Reports**

A series of planning study reports began, with Bruce Hyman presenting for Portland. He advised they are primarily focused on management strategies rather than infrastructure strategies. He advised the American Planning Association designated Commercial Street as one of the Great American Streets in 2008, and they are committed to keeping it that way.

Bruce noted that during summer, safety is a primary concern. He noted the middle of Commercial Street, within the Comprehensive Plan is to maintain the working waterfront and keeping it authentic.

Bruce also explained how people want the predictability of travel and they are hoping to maintain good access to the waterfront, and safe pedestrian crossing.

Bruce noted outreach was completed and they used keypad polling for real-time feedback from participants. The public was asked what the highest priority was in the city, and the response was maintaining the waterfront, pedestrians, and transit, bicycle/pedestrian safety.

Bruce highlighted a series of goals, noting that the 1\textsuperscript{st} goal was improving travel time and the reliability of travel time, and the 2\textsuperscript{nd} goal was running transit in the regular travel lanes.

Bruce also answered questions about transit service and noted that an idea was to move the transit one street up the hill and allocating the service from commercial street. Bruce anticipated having this reported completed by the end of November.

Adam Bliss presented Freeport’s study, and advised it was a joint effort between Freeport, PACTS and MaineDOT. He advised the three elements that helped the study were as follows:

1.) **Town Living Plan** – a holistic plan created in 2012, identifying bike/ped water way opportunities to town facilities.

2.) **A design that explored opportunities to connect the western residential zone to the village where the schools are.**

3.) **Planned bridge rehabilitation projects at Exit 20 and 22.** Adam noted these are opportunities to connect the two pieces of the town.

Adam advised the study pre-dated DOTs involvement in the bridge rehabilitation project and the active living plans support some sort of feasibility study. Adam noted HNTB looked at 14 locations (7 bridges, 7 tunnels) and evaluated 5 bridges and tunnels due to potential conflict with the wetland, steams, buildings and topography issues.
Adam advised 4/5 crossed 295 and the 5th crosses Mallet Drive (exit 22). Adam advised the end result is that the bridge would be between 2-5 million dollars. It was meant for bridge bike ped crossing working with DOT, we hope for lower costs on everyone.

Adam was asked what kind of bike connections he was looking at, and he advised there is a good width of the bridges along with sidewalk and shoulder, and the traffic signal is going to have to be accommodated as well. He noted the objective is to safely move people, and that MaineDOT is still doing preliminary design to find the clearance of width and height.

Jay Chace from Scarborough presented his joint study with Saco, and advised he was working with Tom and MaineDOT on PACTS funding.

Jay highlighted the Route 1 border from Scarborough to Saco, and advised they were trying for good flow of traffic and were finding trouble at the villages. He noted they were looking at bike-ped users to determine how can we coordinate between the communities for it to flow in a better way, and that Rt 1 needs better access management.

Jay noted they’ve had public meetings and surveys to see what the people want from Rt 1 and talked to business owners as well. He referenced a PowerPoint that showed each section and what they were currently working on. Jay noted the following:

1- Casco Road to Old Blue Point Road- coming out of Saco into Scarborough, zoning has been updated in the past 6-10 years, and a project came through to see what the zoning has done. There are 4 lane highways, 2 going north 2 going south, for left turn lanes and right of way. The center left turn lane is a focus, as they wouldn’t enable traffic flow, but we should research before we move into doing this.

2- Access management issues introduce concept of center left turn lane, there are benefits and problems, he noted he might put in a median.

3- Rt 1 heading northbound, there’s a connector and traffic falls off on this connector. There’s a 4-lane wide pavement area into a 3 lane where we can fit bike-ped lanes and sidewalks.

Emily Prescott presented from Saco, and advised they were on the same page as Scarborough but have some recommendations on the Saco side. She noted the following:

0- Improve the functionality of Rt 1 and Ocean Park at the Hannaford entrance, as that area can get busy during summer traffic, and people cut right through and go to Ocean Park Rd. They are hoping to remove the through movement and add a crosswalk to help pedestrians.
1- Better sidewalks and crosswalks for Thorton Academy’s “Hamburger Ally”
2- Side streets better connected to existing sidewalks and alternate routes for bicyclists to take
3- Review bus stop locations, i.e. Funtown parkway and business parks
4- Landscaping/design improvements, specifically Ocean Park drive into Portland Road to make the area more welcoming and slowing down traffic.
5- Side streets better connected to sidewalks.
6- Bus stops- south bound, review bus stop locations to investigate, Funtown parkway, business parks.
7- Landscaping/design improvements. Ocean Park drive into Portland road, make area more welcoming and slowing down traffic.
8- A 2005 Main St Access Study recommended getting rear access along Maine Street, where McDonalds and Hannaford connect.
9- Better access management requested on some properties from Portland Road going up to Scarborough.

The South Portland representative referenced his presentation regarding Transit service bus and marine, upgrading traffic signals, pedestrian crossing. He noted valuable development could lead to different types of transit services, and that accidents are occurring at the primary intersections with not a lot of extra capacity. He explained that what we want out of this study is a really strong recommendation for increasing the amount that comes from PACTS. He also noted there are currently 15 properties on route, and that more money is needed, as there is a lot of traffic coming off the bridge. He also confirmed that these are in the beginning stages, and that reviews will be completed by December.

5. UPWP Update

In October, the PACTS committee approved the UPWP for 2020 and 2021, and put it out for public comment, which closes on 11/27/19. Over two years, there were 2 documents that were the foundation of the UPWP.

The Executive Committee approved the merge of the official improvement of the subcommittee, who approved our federal dollars. This subcommittee is merging with the framework committee. It was also noted that the Long-Range Public Transportation is almost done, and that this will have to be completed by September of 2021.

6. Adjourn

A motion was made to adjourn. All were in favor.
Mission Statement
The PACTS Planning Committee is advisory to the Policy Committee and is responsible for tracking the implementation of the region’s long-range transportation plan. The committee will focus on advising the Policy Committee about current and future planning and capital projects to help achieve PACTS’ long-range planning goals.

Committee Responsibilities

1. **Long-range planning implementation:** Track progress and measure progress/effectiveness.
   - Destination 2040.
   - Regional long-range plans (Active Transportation Plan/Moving Southern Maine Forward)
   - PACTS funded planning projects.

2. **Current/ongoing planning projects:** Provide ongoing input and recommendations to help advance long-range planning priorities.

3. **Future planning and capital projects.**
   - Long-Range Regional Transportation Plan. Participate in updating the plan every five years.
   - UPWP. Develop and scope new project recommendations.
   - Capital funding. Provide funding recommendations on proposed TIP projects to the Policy Committee.

Next Steps

**Short Term**

1. **Long-range planning implementation:**
   - Destination 2040 recommendations matrix for tracking.
   - Provide input on Moving Southern Maine Forward implementation.

2. **Current/ongoing planning projects:**
   - Committee appointment to TIP sub-committee.
   - Provide input on ongoing PACTS funding planning projects.
   - Provide input on Active Transportation Plan.

**Long Term**

1. **Long-range planning implementation:**
   - Develop a process for tracking long-range planning.

2. **Current/ongoing planning projects:**
   - Formalize involvement in ongoing PACTS funded planning projects.

3. **Future planning and capital projects:**
   - Oversee updating the Long-Range Regional Transportation Plan every five years.
   - Develop and scope new projects for the next UPWP.
   - Provide funding recommendations to the Policy Committee.
**Meeting Dates:**
February 6th
April 2nd
May 12th (Joint Tech Committee Meeting)
July 2nd
October 1st
**Joint Transit Committee Meeting TBD**

**Agenda Topics:**

**Housed in Planning Committee:**
1. UPWP review
2. Review of D2040 accomplishments
3. Regional Complete Streets Policy
4. Transportation Climate Change Initiatives

**Provide Feedback:**
5. Municipal Planning Studies: South Portland Mill Creek to Cushing Point presentation and RFP, Saco Island and Biddeford Mill District TOD
6. Regional Planning Studies: Transit Tomorrow, Destination 2045 updates
7. TIP Funding Framework Update

**Presentations and Trainings:**
- Housing Policy- Jeff Levine
- Comp Plan Visioning and Goals- Ben Smith
- Maine DOT Planning Division Check in with Jennifer Brickett
- Implementation Strategy for Active Transportation Plan- Zoe Miller/Rick Harbison
- Climate Change – Transportation & Climate Change Subcommittee, Maine Climate Council Transportation Working Group- Kristina Egan/Sara Cushman
May 14, 2019

Via email: jberna@gpcog.org

Ms. Jessa Berna, AICP - Senior Land Use Planner
Greater Portland Council of Governments (GPCOG)
Suite 201, 970 Baxter Boulevard
Portland, ME 04103

Re: PACTS 2020-21 UPWP – South Portland Application
   Mill Creek to Liberty Shipyard Priority Corridor Study

Dear Ms. Berna:

The application which this letter accompanies is the collaborative work of several members of our City staff including: members of our Planning, Economic Development, Public Works, Parks, Recreation, and Waterfront, Sustainability and Executive Departments, as well as others within the City. Let us begin by stating the heartfelt pride we have collectively, in both the thoughtfulness and quality of our work. In South Portland, we believe in “Making All Things Possible”. This is so much more than just a slogan, it is an objective we, who are privileged to be able to serve as elected leaders in this wonderful City of South Portland, along with our City Manager and staff work to aspire to each and every day!

Over the years we have worked collaboratively on many initiatives with your organization and our sister communities within the region. The study proposal contained in the accompanying application is another such opportunity for collaboration and is supported by both of our municipal neighbors. Letters of support from the Town of Cape Elizabeth and the City of Portland are included with our application. We believe the study work contained in our Application, and the ultimate implementation of enhanced traffic signalization along Broadway and the intersections in Mill Creek, as well as, the potential return of a water-based transit option are high regional priorities.
We have much underway in our community in terms of development opportunity and evolution. We are working to thoughtfully marshal our local and regional resources in the most responsible and sustainable manner possible for not only the benefit of our residents and visitors here in South Portland, but for all within our region. The components of the study referenced above will do much to improve existing challenges in our transit system in addition to providing the opportunity for future development within both our community and the region in a thoughtful, manageable, environmentally sensitive, and sustainable manner.

Should you have any questions regarding our application, or any of the matters referenced herein, please contact us.

In appreciation for your consideration and, on behalf of our residents, my fellow City Councilors, and City staff, we request your support and approval of the accompanying application.

Sincerely,

[Signature]

Claude V.Z. Morgan, Mayor

cc: South Portland City Council
    Scott Morelli, City Manager
    Joshua J. Reny, Assistant City Manager
    Tex Haeuser - City Planner
    William J. Mann - Economic Development Director
    Justin Barker, Community Planner
CITY OF SOUTH PORTLAND

CLAUDE V. Z. MORGAN
Mayor

SCOTT T. MORELLI
City Manager

EMILY F. SCULLY
City Clerk

SALLY J. DAGGETT
Jensen Baird Gardner & Henry

IN CITY COUNCIL
ORDER #183-18/19

ORDERED, that the City Council hereby authorizes the City Manager, or his designee, to submit a PACTS Unified Planning Work Program (UPWP) Study Application, commits the City to fund $18,000 in the FY21 CIP from the TOD TIF for the City's share of local matching funds, and accepts $18,000 as a match from PK Realty Management, and $54,000 from PACTS, to fund a study of various transportation improvements along the Cushing's Point Priority Corridor.

Fiscal Note: $18,000 from TOD TIF - Estimated Local Share

Date: May 14, 2019

A True Copy Attest:

Susan J. Henderson
City Clerk, City of South Portland, Maine

Dated May 20 2019
**Overview**

**Study Title:** Mill Creek to Cushing’s Point Priority Corridor Study

**Proposed Municipalities:** South Portland

**Geographic Area:** Broadway corridor from the Casco Bay Bridge east to Cushing’s Point and the South Portland waterfront proximate to Cushing’s Point and Spring Point.

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**Project Manager Contact Information:**

Justin Barker, Community Planner  
Office: (207) 767-7633  
Email: jbarker@southportland.org

**Project Description:** A study to address existing transportation deficiencies between the Casco Bay Bridge and Cushing’s Point, in South Portland, and improvements that will be needed to accommodate significant new
development in the Cushing’s Point/Spring Point area. The Smart Corridor Study (a joint Portland-South Portland project) focused on pedestrian improvements along eastern Broadway; these improvements are being considered for a bond proposal this fall. The Mill Creek to Cushing’s Point Priority Corridor Study will go beyond the 2018 Smart Corridor Study to consider and propose several specific ways of increasing capacity in an environment where road widening is not an option, including increased transit service, improved traffic signal operations, and marine transportation to and from Portland.

Potential Stakeholders:  
MaineDOT  
South Portland Bus Service  
South Portland Fire Department  
South Portland Public Works Department  
Portland Metro  
Casco Bay Lines  
SMCC  
Liberty Shipyard (30+ acres of developable land)  
Ferry Village neighborhood  
Willard Beach neighborhood  
Meeting House Hill neighborhood  
Mill Creek commercial center  
South Portland commuters  
Cape Elizabeth commuters  
Portland commuter  
Commuters from other communities north & south of S. Portland

Additional Match:  
The local match for this study would be 40%. It would consist of 20% from the City and 20% from a private source (Liberty Shipyard).

Purpose and Need Statement

Average annual daily traffic (AADT) data was obtained from the most recent 2017 Annual Traffic Count report, published by the Maine Department of Transportation (MaineDOT). Additionally, 2019 data was provided from turning movement counts performed by Gridsmart cameras by Sebago Technics: The results are shown below:

<table>
<thead>
<tr>
<th>Broadway Description</th>
<th>2016</th>
<th>2019</th>
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<tbody>
<tr>
<td>East of Waterman Drive</td>
<td>---</td>
<td>28,110*</td>
</tr>
<tr>
<td>East of Route 77/Ocean Street</td>
<td>---</td>
<td>21,400*</td>
</tr>
<tr>
<td>Northeast of Cottage Road</td>
<td>16,880</td>
<td>19,030*</td>
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Current average daily traffic volumes range from 28,000 in the multi-lane westerly portion of the corridor, decreasing as one progresses easterly along the corridor. Based upon the one common point in the AADT data, the average recent annual traffic growth rate has been 4%. That sort of high annual vehicular growth rate cannot be sustained on a congested corridor like Broadway without the implementation of a plan to enhance the existing capacity of the corridor. Planned development of Cushing’s Point will potentially expand volumes along the entire corridor while additional development in the Knightville and Mill Creek areas will primarily impact the higher volume westerly-end of the subject corridor, in the vicinity of Casco Bay Bridge.

Accident data for the Broadway corridor, from Breakwater Drive/Benjamin Pickett Street to Erskine Drive, was obtained from MaineDOT for the most recent three-year period, 2015 to 2017. There is one existing high crash link along the 2.19 mile-long corridor. Additionally, if trends continue, which they likely will, unless something is done to improve both the efficiency and capacity of the Broadway corridor, an additional intersection and two more corridor segments will soon reach the high crash criteria threshold. These locations are described below:

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<tr>
<th>Broadway Location Description</th>
<th># of Acc</th>
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<tbody>
<tr>
<td>Between S. Marriner Street and Pine Street</td>
<td>8</td>
<td>2.14</td>
</tr>
<tr>
<td>Intersection of Pine Street</td>
<td>7</td>
<td>1.25</td>
</tr>
<tr>
<td>Between Clemens Street and Margaret Street</td>
<td>7</td>
<td>1.17</td>
</tr>
<tr>
<td>Between Scammon Street and Waterman Drive – westbound</td>
<td>8</td>
<td>0.97</td>
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Level of Service (LOS) is a qualitative measure that describes operations by letter designation. The levels range from A - very little delay to F - extreme delays. Level of service "D" is generally considered acceptable in urban locations while LOS "E" is generally considered the capacity of a facility and the minimum tolerable level. Existing data for Broadway was compiled from the following reports/memorandums:

- Waterman Drive Lane Use Assessment, prepared by Gorrill Palmer, dated 12/1/2015
- Broadway Corridor Intersection Improvement Study, Sebago Technics, July 2012

Based upon the 2012 Broadway Corridor Study, the major Broadway intersections of Waterman Drive, Ocean Avenue, and Cottage Road all were operating at LOS "E" overall during the PM peak hour under the older 2012 volumes. With that overall poor LOS, several intersection approaches were failing, as would be expected. Additionally, several higher volume side streets would also expect to be failing given the limited gaps on Broadway to accept entering vehicles. The study focused upon low-cost improvement options to lessen delays. The improvement in delay expected, however, was anticipated to be minimal and was expected to be offset by growing traffic volumes.
The Broadway corridor, between the Casco Bay Bridge and Cushing Point is heavily developed with homes and businesses in close proximity to the sidewalks located on both sides of the roadway corridor. This leaves little room for any significant physical widening, such as lane additions. Given this, the ability to address existing capacity issues or accommodate additional development volumes through physical widening is not feasible. Given this, the focus to address existing Broadway capacity constraints and provide for future development must instead be focused upon:

- Increasing transit usage, including the possible provision of potential water-based transit between South Portland and Portland, such as a water bus.
- Improving traffic operations along the corridor by the provision of Adaptive Traffic Signals (ATS) since it is understood there have been issues maintaining coordination along the corridor through traditional “time-based” methods.

Hence, the proposed study will:

- evaluate means and feasibility of increasing transit use in South Portland to decrease Broadway volumes.
- explore the feasibility of providing water-based transit between South Portland and Portland, again to reduce individual vehicular traffic volumes along Broadway and to provide for the redevelopment of Cushing’s Point.
- Evaluate the impact and cost of changing the eight traffic signals (along Broadway and adjacent signals on Highland) to Adaptive Traffic Signals or ATS Control.

**Safety**

As described above, there is currently one existing high crash link along the 2.19 mile-long corridor, and one intersection and two more segments are approaching the high-crash criteria threshold. The relieving of congestion through improved signal operations and expanded transit opportunities will have a positive impact on improving safety.

**Equity and Mobility**

As a community, the demographics of South Portland are changing. Our senior population is increasing, and expanded transit service will increase equity in transportation opportunities for seniors who no longer can (or should) drive a car. We are also experiencing a growth, both on a percentage and absolute basis, in the number of lower income residents in our community. Mobility, which has been documented above as being poor in this corridor, will be improved via the installation of adaptive signal controls and transferring some trips from cars, the majority of which are carrying only one passenger, to transit.

**Economic Development**

A large development opportunity in the corridor is the Liberty Shipyards (formerly Cacoulidis) property located on the South Portland waterfront west of Bug Light Park. A 2005 project in that location included residential, hotel, marina, and accessory retail. Other development in the corridor will occur in Mill Creek, which is in a downtown TIF district and which has recently been rezoned based on an adopted master plan, and in the “pears-on-a-string” neighborhood activity centers called for along Broadway by the City’s Comprehensive Plan. Total additional development in the corridor is projected to include:
- Residential – condos: 780,000 sf
- Residential – apartments: 450,000 sf
- Retail: 56,000 sf
- Hotel: 200,000 sf
- Marina: 92 slips

As described above, this potential economic development is largely dependent on improving the transportation functionality of the eastern Broadway corridor.

**Sustainability**

South Portland seeks to be a leader in sustainability, and shifting some of the trips in the corridor to marine-based as well as road transit will help to reduce greenhouse gas emissions. Similar reductions will also result from less idling of cars at traffic signals due to the installation of adaptive signal controls.

**Scope of Work**

**Traffic Signals Improvements**

The Adaptive Traffic Signal (ATS) study will review existing conditions along the Broadway study corridor, including the Erskine Drive signal on Casco Bay Bridge, and the two adjacent signals feeding Broadway on Highland Avenue, at Ocean Street and Cottage Road. It is understood that present “time-based” coordination has not been effective on the Broadway corridor. Hence, the study will begin with queue observations at some of the existing signals under AM, mid-day, and PM peak hour conditions. Additionally, some turning movement counts will be conducted to supplement the Gridsmart turning movement count data obtained from the three Broadway intersections currently equipped with this camera technology. Existing conditions will be analyzed for the determined analysis period(s). This review and analysis will identify specific reasons as to why operations have been limited under the current coordination plan. The current operations discussion will be created by following the “Model Systems Engineering Documents for Adaptive Signal Control Technology (ASCT) Systems, Chapter 3.0 User-Oriented Operational Description”. Most importantly, the study will document the needs that cannot be achieved with the current system and state goals that are known to be achievable with ASCT. The study will recommend an opinion as to whether or not installation of ASCT would be expected to result in better operations (lesser delays and queues). Additionally, if adaptive signal control is determined to be beneficial to the overall Broadway signal system then the study will determine an order of magnitude cost estimate for the signal upgrades so that design and construction funding can be secured.

**Bus Service Expansion**

- Provide an analysis of the existing bus service in the study area including routes, bus stop locations, operation period/frequency, historical & current operational/passenger usage data, key user demographics/behavior patterns, ongoing sustainability, and future growth plans.
- Provide an analysis of the following items, at a minimum: alternate routes, additional equipment (buses), modified stop locations, and the consideration of additional/less stops.
- Provide an analysis of costs and potential funding sources for infrastructure & operational costs.
- Provide preliminary recommendations for improved bus service frequency within the study area.
- Include an outline of acquired project data, consultation activities, meetings, and milestones. A summarization of the data acquisition process and citations of associated data sources.
- Provide copies of all project data sources/consultation records, and all associated project documents as separate attachments to the final study.

Marine Transit Service

- Conduct a market analysis of potential users including forecasted demand, operation/trip frequency recommendations, key user groups/target markets including but not limited to, individuals, formal and informal user groups, primary reasons and frequency of use, and their associated demographics/behavior patterns and possible engagement strategies.
- Provide analysis of existing passenger marine transportation operations including routes, fees, vessel specifications/capacity, passenger frequency data, operation period/frequency, historical & current operational/passenger usage data, key user demographics/behavior patterns, characteristics of successful passenger services, ongoing sustainability, and future growth plans.
- Analyze general marine conditions, i.e. wave action, wake/depth constraints, and existing boating traffic.
- Identify and analyze potential port locations in respective communities, capacity, associated capital investment/upgrade and development requirements, i.e. docking, parking, operational, pedestrian, and bicycle infrastructure.
- Assess level of interest and capacity of existing operators to operate a regularly scheduled South Portland/Portland marine transit service.
- Forecast associated start-up and ongoing capital costs, ongoing operational requirements, as well as all ongoing expense and revenue projections for all project elements. Provide passenger/trip fee structure recommendations.
- Provide preliminary recommendations for potential vessels including specifications, passenger capacity, providers, purchase/operational costs.
- Provide an analysis of potential funding sources for associated start-up infrastructure & operational costs.
- Provide an outline of potential and recommended operating entity structures.
- Forecast internal & external risks to development and ongoing operation.
- Provide overall marine transportation feasibility recommendations based on results of data collection, analysis, and consultation process.
- Include an outline of acquired project data, consultation activities, meetings, and milestones. Summarize the data acquisition process and cite associated data sources. Provide copies of all project data sources/consultation records, and all associated project documents as separate attachments to the final Feasibility Study.
Cost Estimate

The costs for the proposed study are broken out as follows:

<table>
<thead>
<tr>
<th>Traffic Signals Improvements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Collection</td>
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<tr>
<td>Existing Conditions Analysis</td>
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<tr>
<td>Adaptive Review</td>
<td>$15,000</td>
</tr>
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<td>Meetings &amp; Documentation</td>
<td>$8,000</td>
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<td>Subtotal</td>
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</table>

<table>
<thead>
<tr>
<th>Bus Service Expansion</th>
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<tbody>
<tr>
<td>Data Collection</td>
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<tr>
<td>Analysis</td>
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<tr>
<td>Meetings &amp; Documentation</td>
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<tr>
<td>Subtotal</td>
<td>$25,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marine Transit Service</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Collection</td>
<td>$6,000</td>
</tr>
<tr>
<td>Analysis</td>
<td>$10,000</td>
</tr>
<tr>
<td>Meetings &amp; Documentation</td>
<td>$4,000</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$20,000</td>
</tr>
</tbody>
</table>

| Total                                            | $90,000  |

The source of funds is as follows:

- $18,000 City of South Portland (20%)
- $18,000 Liberty Shipyard (20%)
- $54,000 PACTS (60%)
- $90,000 Total

Local and Regional Priorities

Local Priorities

There are several aspects of the Comprehensive Plan that this study supports. The Mill Creek and eastern waterfront areas are highlighted as areas for growth and anticipated future development, with several goals to support this. A master plan for Mill Creek was completed in 2015, envisioning what future build-out of this area should consider. In early 2019, the City Council re-adopted a goal to complete a Waterfront Master Plan.

For the Broadway corridor and road network in particular, the following local objectives and policies are supported:

- To maintain and enhance the ability of the road network to move traffic safely and efficiently while providing a high level of accessibility to residential neighborhoods, commercial areas, and job centers.
- To minimize the impact of vehicular traffic on residential neighborhoods.
To expand the range of non-automotive transportation alternatives available to the City’s residents, workforce, and visitors.

The City should undertake a study of possible traffic improvements in the Broadway Corridor.

The City should work to channel traffic from the residential neighborhoods along Broadway to signalized intersections to minimize delays for traffic trying to enter Broadway during peak hours.

The City should continue to improve traffic flow and safety on the arterial network through the upgrading of intersections.

The City should work to increase the frequency of bus service and other public transit along the major corridors where higher-density development is proposed in the Future Land Use Plan.

The system should continue to work with Southern Maine Community College (SMCC) and major employers to provide service that encourages students and workers to use public transportation rather than driving.

The City should consider adding other properties to the Transit TIF District on a case-by-case basis if the development will create the potential for expanded transit use.

The City should continue to work with other transit providers in Greater Portland and PACTS to develop a more regional and integrated transit system.

If there is additional development and/or redevelopment in the eastern waterfront area that has the potential for significantly increasing traffic on Broadway, the City should work with private-property owners/developers, PACTS, and the Casco Bay Transit District to explore the creation of a water based transportation connection between the Shipyard/Spring Point area and Portland.

Allow more intense utilization of the land along the major traffic corridors while assuring that the adjacent residential neighborhoods are protected and the ability of the streets to move traffic is maintained – the Main Street, Broadway, and Cottage Road corridors are, and will continue to be, major traffic arteries. Many of the neighborhood centers that provide services to the adjacent neighborhoods are located along these corridors. These corridors have some potential to accommodate more intense utilization through development and redevelopment. This must, however, occur in ways that recapture these corridors as City streets, while maintaining their ability to move traffic safely and efficiently as well as protecting the adjacent neighborhoods.

Encourage development and redevelopment to occur in a way that makes the use of alternative transportation more feasible by focusing growth along the major transportation corridors - An objective of the Comprehensive Plan is to expand the opportunities for alternative transportation - to make it easier and safer for people to walk and cycle, as well as to improve bus service. Therefore, a land use objective is to allow and encourage development and redevelopment to occur in areas where it can be served by transportation alternatives. Essentially, this involves encouraging more compact development in the Mill Creek/Knightville area, along the Broadway, Cottage Road, and the Main Street corridors.

**PACTS Destination 2040 Goals**

**Maintain a Regional Focus** – The section of the Broadway Corridor between Casco Bay Bridge and Ocean Street has been identified as a Priority Corridor and Priority Center. It serves an important regional role of connecting Portland, South Portland, and Cape Elizabeth, the
primary route for many commuters. There have been a lot of conversations about the possibility of a marine transportation connection between Portland and South Portland. However, no technical study to determine the level of feasibility for different options has been completed. This study will provide the opportunity to evaluate additional options for better connecting the largest and fourth largest cities in the state.

1. **Support Economic Development** – Two of South Portland’s priority economic development areas bookend the study area: Knightville/Mill Creek and Bug Light/SMCC. With the completion of the Mill Creek Master Plan (2015), subsequent zoning amendments (2016 & 2019), and the recent purchase of the Cacoulidis property (late 2018) by the Liberty Shipyard, these areas are ripe for future development/renovation. This study will provide an opportunity to evaluate scenario planning options and what anticipated transportation needs could or should support anticipated uses.

2. **Prioritize Mobility, Safety, and Accessibility** – There are several aspects of the proposed study that will achieve this goal. The study will look at signal coordination and prioritization within the Mill Creek area to improve overall traffic flow and safety. Increased or modified public transportation will be evaluated along Broadway to improve accessibility options and alleviate the possibility of increased congestion with additional development.

3. **Incorporate Energy Conservation** – The proposed study will support this goal primarily through the research of alternative transportation strategies to reduce the dependency on single-occupant vehicles. A primary goal of the study will be to retain the existing infrastructure and consider existing resources to accommodate anticipated growth. By evaluating the study area as one project, it conserves City resources by reducing the need for extensive regional evaluation of each individual development as those opportunities present themselves.

4. **Integrate Land Use** – The Knightville/Mill Creek area and Bug Light/SMCC are designated Growth Areas in the South Portland Comprehensive Plan and are both identified as Priority Centers in Destination 2040. Understanding the development potential of these areas and the associated transportation needs can help inform and responsibly support future growth. This study enables a more holistic approach to these areas as potential transit-oriented development centers as opposed to a project-by-project review basis.

5. **Protect Environmental Quality** – The premise of this study is to look at alternative ways to accommodate increased development without significantly increasing vehicular traffic volumes or expanding roads. The study will consider alternative transportation strategies that look to maintain or (preferably) reduce carbon emission levels and do not require increasing impervious surface, which can lead to maintaining or improving air and water quality.

The proposed study is in line with the top priorities of Destination 2040 that were identified as part of the 2018-2019 PACTS Priorities Workshop.
1. **Improve and expand public transportation** – The study will look at how to improve and increase public transportation services to support anticipated growth at two of the Destination 2040 Priority Centers (Knightville/Mill Creek and Bug Light/SMCC).

2. **Install better traffic signals and create safer intersections** – The study will evaluate how to improve traffic signal coordination and prioritization in the Mill Creek area, which serves as a major thoroughfare between Portland, South Portland, and Cape Elizabeth.

3. **Encourage housing in places people are already living and working** – These Priority Centers serve as significant employment centers. Recent zoning amendments and anticipated development could encourage a significant number of housing units in these areas. The study will help determine appropriate transportation needs to accommodate the development of housing in these areas.

Additionally, the inclusion of a feasibility study for marine transportation meets an additional top-5 priority for the Central Region of a *South Portland to Portland Ferry* and top-10 priority of the PACTS Policy Committee to *better get commuters on/off the Portland Peninsula*.

**Moving Southern Maine Forward Goals**

**Increase regional ridership** – This study will look at options for improving and increasing public transportation services to support anticipated growth. Service enhancements for these areas will have a regional benefit, supporting travelers between Portland, South Portland, Cape Elizabeth, and surrounding communities.

**Decrease travel time** – The potential for a marine transportation connection between South Portland and Portland could dramatically decrease travel time for commuters from the east end of South Portland to downtown Portland, or from Portland to SMCC. Increased transportation services on Broadway could also improve travel time in coordination with or alternative to a marine transportation option. Signal prioritization in the Mill Creek area could reduce wait times for buses, leading to an overall decrease in travel time.

**Optimize the return on the investment in transit** – The proposed study will look to optimize transit services/ options to create the greatest return on investment. Much of the anticipated investment would be in the form of increased or modified service vs. new vehicles, equipment, infrastructure, etc.

**Reduce emissions** – As mentioned in the Destination 2040 goals above, this study will look at alternative transportation strategies that will retain or improve the current level of environmental quality.

**Improve safety** – This study will look to reduce conflict for public transportation services and increase ridership, both of which can lead to safer roads by reducing the reliance on single-occupancy vehicles. By coordinating and prioritizing the traffic signals in the Mill Creek area, traffic can flow smoother and more efficiently, which can lead to reductions in conflict.

**Improve connectivity** – A marine transportation connection between South Portland and Portland would create new opportunities for people to travel between communities. The study will also focus on improving scheduling and routing for the buses, leading to faster and more frequent connections.
Maine Strategic Transit Plan 2025
The proposed study aligns with some of the top goals of this plan.

1. Manage the existing system – The study will evaluate ways to improve the current transportation network and transit services to identify where improvements can be made.

2. Support Economic Opportunity – The study will look at how the transportation system can accommodate and support anticipated growth in the two priority areas covered by the proposed study.

Active Transportation Plan
The proposed study aligns with several of the Guiding Principles and Goals of the Active Transportation Plan, several of which overlap with the Destination 2040 and Moving Southern Maine Forward goals. Additionally, this study will require close coordination with Maine DOT, creating opportunity to further several of the recommendations of this plan related to safety and funding.

Other Documents
The proposed study will provide opportunity for public engagement consistent with the PACTS Public Involvement Policies and Practices. The study will work to achieve equal opportunity in all decisions in a manner that is consistent with the PACTS Title VI Environmental Justice Non-Discrimination Plan.

The Smart Corridor Plan was completed in 2018, which takes a broader look at transportation improvements stretching from northern Portland all the way to the eastern waterfront of South Portland, included this area as part of the plan. The proposed study will incorporate the findings of that study, but will go beyond it to consider and propose several specific ways of increasing capacity in an environment where road widening is not an option.

South Portland Comprehensive Plan
https://www.southportland.org/files/4113/7279/7365/Final_Plan_Adopted_10-15-12_without_Appendices.pdf

Mill Creek Master Plan

South Portland City Council Goals

Destination 2040

Moving Southern Maine Forward

Maine Strategic Transit Plan
https://www.dropbox.com/s/gxtri3r2pxswokd/MaineStrategicTransitPlan2025.pdf?dl=0
Active Transportation Plan

Portland-South Portland Smart Corridor Plan

### Implementation

The next steps and timeline for the study would be as follows:

<table>
<thead>
<tr>
<th>Month/Period</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2019</td>
<td>Policy Committee adopts the UPWP</td>
</tr>
<tr>
<td>November</td>
<td>Formation of a Study Committee with stakeholder representation</td>
</tr>
<tr>
<td>December</td>
<td>First meeting of the Study Committee</td>
</tr>
<tr>
<td>December</td>
<td>Development of RFP for the study consulting team</td>
</tr>
<tr>
<td>January 2020</td>
<td>Selection of a study consulting team</td>
</tr>
<tr>
<td>February - April</td>
<td>Review of the Purpose &amp; Need, definition of objectives, and data analysis</td>
</tr>
<tr>
<td>May</td>
<td>Public Forum #1 – to review project and obtain citizen input</td>
</tr>
<tr>
<td>June - August</td>
<td>Alternatives analysis and development of implementation-ready preferred solutions</td>
</tr>
<tr>
<td>September</td>
<td>Public Forum #2 – to seek input for refining the solutions</td>
</tr>
<tr>
<td>October 2020</td>
<td>Delivery of the study report</td>
</tr>
</tbody>
</table>

### Possible Funding Sources for Implementation

One of the primary sources of funds would be revenue from the Transit-Oriented Development Tax Increment Financing (TIF) District the City created ten years ago that includes the large 30-acre parcel of the several parcel assemblage that Liberty Shipyard purchased adjacent to Bug Light Park in late 2018. (There are 20 years remaining for this TIF.) Another possibility is the designation of a new project-specific Development/TIF District comprised of all of the Liberty Shipyard owned parcels (30+ acres) to extend the life of that contemplated new Development District to the maximum 30 years, as allowed under Maine law. The revenue from the existing Development District may be used for bus driver/water taxi driver salaries, fuel, maintenance, and other operating expenses as well as for capital improvements. A new Development District would include those existing authorized uses as well perhaps some others, subject to City Council and State of Maine approval. The redevelopment of the Liberty Shipyard property is anticipated to provide a substantial amount of TIF revenue, some of which would be used for implementation of the study’s recommended improvements.

Other potential sources of funds include:

- Off-site improvements required as part of the site plan approval for the Liberty Shipyard property.
- Other City TIF funds.
- PACTS highway and/or transit capital allocations.
- City Capital Improvement Program funds (non-TIF).
- Municipal Partnership Initiative (MPI) or Business Partnership Initiative (BPI) funds.

**Letters of Endorsement and Funding Support**

Please see attached the following:
- Endorsement letter from the Portland City Manager
- Endorsement letter from the Cape Elizabeth Town Manager
- Funding participation and endorsement letter from PK Realty Management
May 14, 2019

Via email delivery c/o City of South Portland (jpbarker@southportland.org)
Ms. Jessa Berna, AICP - Senior Land Use Planner
Greater Portland Council of Governments (GPCOG)
Suite 201, 970 Baxter Boulevard
Portland, ME 04103

Re: PACTS 2020-21 UPWP – South Portland Application
Mill Creek to Liberty Shipyard Priority Corridor Study

Dear Ms. Berna:

Please accept this letter as a declaration of the City of Portland’s support for the above referenced study application. The implementation of the elements to be reviewed in the proposed study will have a positive regional impact on transit, commerce, employment opportunity, and quality of life. This is certainly true for those who utilize the Broadway corridor for commuting on a regular basis but it is also true for those from our side of the harbor who commute to South Portland who experience a slowed commute due to congestion along Broadway, in the Millcreek area just south of the terminus of the Casco Bay Bridge.

We are encouraged by the prospect of the redevelopment of several significant land parcels at Cushing’s Point. We understand that the developers have rechristened their project, the Liberty Shipyard. We congratulate the Packard family on their recent acquisition and wish them much success with the redevelopment of this site. We wish to encourage them to include appropriate parking elements in their plans, likely some sort of structure; and we are enthusiastic about the reintroduction of some regular water-based transit option across the harbor. The addition of such a transit option will serve to promote further investment in both of our communities and make our larger community more livable, all while doing so in a manner that contributes to the reduction in greenhouse gases and is sustainable.

This is a priority project for not only our neighbors in South Portland but also for us in Portland and the larger Greater Portland / Casco Bay region. We strongly encourage PACTS to affirmatively support the above referenced application.

Sincerely,

[Signature]

Jon P. Jennings
City Manager

cc: South Portland Officials: Scott T. Morelli - City Manager, Joshua J. Reny - Assistant City Manager
Tex Hauser - City Planner, Justin Barker, Community Planner William J. Mann - Economic Development Director
City of Portland Officials: Greg Mitchell, Economic Development Director, Bill Needelman, Waterfront Coordinator
May 14, 2019
Via email delivery c/o City of South Portland (jibarker@southportland.org)
Ms. Jessa Berna, AICP - Senior Land Use Planner
Greater Portland Council of Governments (GPCOG)
Suite 201, 970 Baxter Boulevard
Portland, ME 04103

Re: PACTS 2020-21 UPWP - South Portland Application
Mill Creek to Liberty Shipyard Priority Corridor Study

Dear Ms. Berna:

The residents of Cape Elizabeth are privileged to enjoy a high quality of life in one of the most beautiful places in our country. Daily many of them commute to work in communities in all directions; but primarily, they are travelling to South Portland, Portland, Westbrook, or other points to the north and west each workday. The primary commonality these commuters have is travel along Broadway in South Portland via either Cottage Road or Ocean Street through the Mill Creek neighborhood in South Portland. Improving the efficiency of the Broadway traffic corridor should make a significant positive difference in the quality of that daily commuting experience.

Please accept this letter as The Town of Cape Elizabeth’s strong endorsement of the above referenced application. We urge the review committee at PACTS to approve and fund this study and assist in securing the funding to help with the actual implementation of the enhancements contemplated in the proposed study.

Sincerely,

Mathew E. Sturgis
Town Manager
Town of Cape Elizabeth

cc: Maureen O’Meara, Town Planner
    Scott T. Morelli, South Portland City Manager
Via email delivery to Jessa Berna at: jberna@gpcog.org

Ms. Jessa Berna, AICP - Senior Land Use Planner
Greater Portland Council of Governments (GPCOG)
Suite 201, 970 Baxter Boulevard
Portland, ME 04103

Re: PACTS 2020-21 UPWP – South Portland Application
Mill Creek to Liberty Shipyard Priority Corridor Study

Dear Ms. Berna:

On behalf of L&R Northpoint Holdings LLC, my parents Richard & Lauren Packard, my brothers David and Jeff and I want to express our full support for the City of South Portland’s Application for study funding as part of Portland Area Comprehensive Transportation System’s (PACTS) Unified Planning Work Plan (UPWP) for 2020-2021. Our family purchased a little bit more than 30 acres along the South Portland waterfront late last year and over the last six months we have been conducting due diligence work, community outreach, and preliminary development planning for a project we have re-christened Liberty Shipyard. We could not be more pleased with the reception we have gotten both from the folks we work with in South Portland and with your colleagues at GPCOG, as we have begun this process.

We are hopeful that our project, the plans for which are just coalescing will be welcomed by our neighbors, the community, and the greater region as a positive addition and as an enhancement to our community. In order for this to happen, we are mindful that we need to address the concerns and interests of the various stakeholders’ groups. One of these concerns is the issue of transit and traffic. It is critical that we address this elemental issue, as it will influence how we are able to proceed.

The proposed study and of the components being reviewed, once implemented will, we believe have benefits to the entire region and have the potential to shorten commuting times, enhance walkability and transit choices for those that live, work, or visit South Portland.

Please accept this letter and our commitment to the City of South Portland to participate with them in financially augmenting their local funding match for the study application referenced above, that we understand they will be submitting to you shortly. We hope you will support their Application.

Please feel free to reach out with any questions anytime. jp@pkrealtymgmt.com cell: 949 338 8123

Sincerely,

Jennifer Packard
PK Realty Management

cc: Claude V.Z. Morgan, Mayor  Members of the South Portland City Council
    Scott Morelli, City Manager  Joshua J. Reny, Assistant City Manager
    Tex Haeuser - City Planner  William J. Mann - Economic Development Director
    Justin Barker, Community Planner
Overview

Total Emissions in 2017 = 6,457 Million Metric Tons of CO2 equivalent. Percentages may not add up to 100% due to independent rounding.

* Land Use, Land-Use Change, and Forestry in the United States is a net sink and offsets approximately 11 percent of these greenhouse gas emissions, not included in total above. All emission estimates from the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2017.

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Greenhouse gases trap heat and make the planet warmer. Human activities are responsible for almost all of the increase in greenhouse gases in the atmosphere over the last 150 years.1 The largest source of greenhouse gas emissions from human activities in the United States is from burning fossil fuels for electricity, heat, and transportation.
EPA tracks total U.S. emissions by publishing the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*. This annual report estimates the total national greenhouse gas emissions and removals associated with human activities across the United States.

The primary sources of greenhouse gas emissions in the United States are:

- **Transportation** (28.9 percent of 2017 greenhouse gas emissions) – The transportation sector generates the largest share of greenhouse gas emissions. Greenhouse gas emissions from transportation primarily come from burning fossil fuel for our cars, trucks, ships, trains, and planes. Over 90 percent of the fuel used for transportation is petroleum based, which includes primarily gasoline and diesel.

- **Electricity production** (27.5 percent of 2017 greenhouse gas emissions) – Electricity production generates the second largest share of greenhouse gas emissions. Approximately 62.9 percent of our electricity comes from burning fossil fuels, mostly coal and natural gas.

- **Industry** (22.2 percent of 2017 greenhouse gas emissions) – Greenhouse gas emissions from industry primarily come from burning fossil fuels for energy, as well as greenhouse gas emissions from certain chemical reactions necessary to produce goods from raw materials.

- **Commercial and Residential** (11.6 percent of 2017 greenhouse gas emissions) – Greenhouse gas emissions from businesses and homes arise primarily from fossil fuels burned for heat, the use of certain products that contain greenhouse gases, and the handling of waste.

- **Agriculture** (9.0 percent of 2017 greenhouse gas emissions) – Greenhouse gas emissions from agriculture come from livestock such as cows, agricultural soils, and rice production.

- **Land Use and Forestry** (offset of 11.1 percent of 2017 greenhouse gas emissions) – Land areas can act as a sink (absorbing CO2 from the atmosphere) or a source of greenhouse gas emissions. In the United States, since 1990, managed forests and other lands have absorbed more CO2 from the atmosphere than they emit.

**Emissions and Trends**

Since 1990, gross U.S. greenhouse gas emissions have increased by 1.3 percent. From year to year, emissions can rise and fall due to changes in the economy, the price of fuel, and other factors. In 2017, U.S. greenhouse gas emissions decreased compared to 2016 levels. The decrease in CO2 emissions from fossil fuel combustion was a result of multiple factors, including a continued shift from coal to natural gas, increased use of renewables in the electric power sector, and milder weather that contributed to less overall electricity use.

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References


Transportation Sector Emissions

Total Emissions in 2017 = 6,457 Million Metric Tons of CO₂ equivalent. Percentages may not add up to 100% due to independent rounding.

* Land Use, Land-Use Change, and Forestry in the United States is a net sink and offsets approximately 11 percent of these greenhouse gas emissions, not included in total above. All emission estimates from the Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2017.

The Transportation sector includes the movement of people and goods by cars, trucks, trains, ships, airplanes, and other vehicles. The majority of greenhouse gas emissions from transportation are carbon dioxide (CO₂) emissions resulting from the combustion of petroleum-based products, like gasoline, in internal combustion engines. The largest sources of transportation-related greenhouse gas emissions include passenger cars and light-duty trucks, including sport utility vehicles, pickup trucks, and minivans. These sources account for over half of the emissions from the transportation sector. The remaining greenhouse gas emissions from the transportation sector come from other modes of
transportation, including freight trucks, commercial aircraft, ships, boats, and trains, as well as pipelines and lubricants.

Relatively small amounts of methane (CH₄) and nitrous oxide (N₂O) are emitted during fuel combustion. In addition, a small amount of hydrofluorocarbon (HFC) emissions are included in the Transportation sector. These emissions result from the use of mobile air conditioners and refrigerated transport.

**Emissions and Trends**

In 2017, greenhouse gas emissions from transportation accounted for about 28.9 percent of total U.S. greenhouse gas emissions, making it the largest contributor of U.S. greenhouse gas emissions. In terms of the overall trend, from 1990 to 2017, total transportation emissions have increased due, in large part, to increased demand for travel. The number of vehicle miles traveled (VMT) by light-duty motor vehicles (passenger cars and light-duty trucks) increased by 45.9 percent from 1990 to 2017, as a result of a confluence of factors including population growth, economic growth, urban sprawl, and periods of low fuel prices. Between 1990 and 2004, average fuel economy among new vehicles sold annually declined, as sales of light-duty trucks increased. Starting in 2005, average new vehicle fuel economy began to increase while light-duty VMT grew only modestly for much of the period. Average new vehicle fuel economy has improved almost every year since 2005, and the truck share is about 45 percent of new vehicles in model year 2016.

Learn more about [Greenhouse Gas Emissions from Transportation](#).
shown separately (as was done for other sectors). These indirect emissions are negligible, accounting for less than 1 percent of the total emissions shown in the graph.


Reducing Emissions from Transportation

There are a variety of opportunities to reduce greenhouse gas emissions associated with transportation. The table shown below categorizes these opportunities and provides examples. For a more comprehensive list, see Chapter 8 of the *Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*.

<table>
<thead>
<tr>
<th>Type</th>
<th>How Emissions Are Reduced</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Fuel Switching                                  | Using fuels that emit less CO₂ than fuels currently being used. Alternative sources can include biofuels; hydrogen; electricity from renewable sources, such as wind and solar; or fossil fuels that are less CO₂-intensive than the fuels that they replace. Learn more about [Green Vehicles and Alternative and Renewable Fuels](#). | • Using public buses that are fueled by compressed natural gas rather than gasoline or diesel.  
• Using electric or hybrid automobiles, provided that the energy is generated from lower-carbon or non-fossil fuels.  
• Using renewable fuels such as low-carbon biofuels. |
| Improving Fuel Efficiency with Advanced Design, Materials, and Technologies | Using advanced technologies, design, and materials to develop more fuel-efficient vehicles. Learn about [EPA’s vehicle greenhouse gas rules](#).                                                                 | • Developing advanced vehicle technologies such as hybrid vehicles and electric vehicles, that can store energy from braking and use it for power later. |
## Examples of Reduction Opportunities in the Transportation Sector

<table>
<thead>
<tr>
<th>Type</th>
<th>How Emissions Are Reduced</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Improving Operating Practices** | Adopting practices that minimize fuel use. Improving [driving practices and vehicle maintenance](http://example.com). Learn about how the freight transportation industry can reduce emissions through EPA's [SmartWay Program](http://example.com). | • Reducing the average taxi time for aircraft.  
• Driving sensibly (avoiding rapid acceleration and braking, observing the speed limit).  
• Reducing engine-idling.  
• Improved voyage planning for ships, such as through improved weather routing, to increase fuel efficiency. |
| **Reducing Travel Demand**  | Employing urban planning to reduce the number of miles that people drive each day. Reducing the need for driving through travel efficiency measures such as commuter, biking, and pedestrian programs. Learn about EPA's [Smart Growth Program](http://example.com). | • Building public transportation, sidewalks, and bike paths to increase lower-emission transportation choices.  
• Zoning for mixed use areas, so that residences, schools, stores, and businesses are close together, |
### Examples of Reduction Opportunities in the Transportation Sector

<table>
<thead>
<tr>
<th>Type</th>
<th>How Emissions Are Reduced</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>reducing the need for driving.</td>
</tr>
</tbody>
</table>

### References

Fast Facts on Transportation Greenhouse Gas Emissions

The transportation sector is one of the largest contributors to anthropogenic U.S. greenhouse gas (GHG) emissions. According to the *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2017* (the national inventory that the U.S. prepares annually under the United Nations Framework Convention on Climate Change), transportation accounted for the largest portion (29%) of total U.S. GHG emissions in 2017. Cars, trucks, commercial aircraft, and railroads, among other sources, all contribute to transportation end-use sector emissions.