

OVERARCHING PRINCIPLES FOR LAND USE AND WATER INTEGRATION IN THE SAN FRANCISCO BAY AREA

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INTRODUCTION

Water is essential to planning for healthier, sustainable, and more equitable communities. Without water, no one can survive. Stronger and more equitable integration of water in the regional transportation plan will help address the San Francisco Bay Area's current challenges around housing and water unaffordability, inequitable growth, limited water supply, and limited interagency coordination. This integration will also help the San Francisco Bay Area prepare for climate change.

The Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) understand the importance of this integration and have started to integrate water supply considerations into their land-use and transportation decisions. To bolster this effort, this report will:

1**INTRODUCE THE PROJECT**

scope and limitations.

4**EXAMINE HOW CLIMATE CHANGE EXACERBATES**

the four challenges elevated.

2**PROVIDE BACKGROUND INFORMATION**

on the separation of land-use and water, and redlining.

5**SUMMARIZE THE CURRENT ACTIONS OF MTC AND ABAG**

to integrate water and address the four challenges.

3**IDENTIFY THE FOUR CHALLENGES**

that intersect transportation, housing, climate, and water.

6**RECOMMEND OVERARCHING PRINCIPLES**

to guide how MTC and ABAG can create a more holistic regional transportation plan; and further integrate water into land-use planning.

SCOPE

This research, and its recommendations, are focused on the San Francisco Bay Area's regional transportation plan, Plan Bay Area 2050. The regional transportation plan provides a frame of how the Bay Area can develop, which will affect its water supplies. Furthermore, challenges such as climate change or displacement are not constrained by city or county boundaries. Therefore, addressing these challenges through a regional frame will ensure all communities in the Bay Area are healthy, sustainable, and equitable.

The scope has been expanded to include the regional housing needs allocation (RHNA), and the housing element of the general plan. RHNA and the housing element are key components of addressing future housing development, which will impact water supply, as well as concerns around housing affordability.

LIMITATIONS

ClimatePlan recognizes four limitations that are related to the scopes:

- 1 MTC has limited authority.** MTC cannot require local governments, transportation agencies, or water agencies to adopt the strategies they recommend or enforce consequences, unless it is a requirement for their transportation funding.
- 2 Plan Bay Area 2050 is unlikely to address all the water challenges** the Bay Area faces. Plan Bay Area 2050 is a regional plan that covers transportation, housing, and development for vastly unique counties, which have differing challenges and priorities. Local land-use plans and urban water management plans will be more direct in addressing the unique challenges a locality faces. Further, since Plan Bay Area 2050 still has a transportation lens, it will only directly address water challenges that intersect with land-use and transportation challenges. It may also exacerbate equity challenges because the regional plan may perpetuate uneven development patterns.¹

¹ Hernandez, J. (2016). "The Franklin Plan: Using Neighborhood based energy efficiency and economic development to implement sustainable community principles." Retrieved from <https://www.capradio.org/media/11853851/Franklin%20Economic%20Plan%20-20Final%2020170418-sm.pdf>.

3

There are structural limitations that hinder MTC and ABAG from addressing some of challenges. Structural limitations include Proposition 218, Proposition 13, and Proposition 26, which all regulate how funding is used, and how much funding can be collected. Proposition 13 and 218, and their limitations will be examined more in depth later in this report. Proposition 26 amends California's constitution to require a two-thirds supermajority to pass taxes and fees.²

4

ClimatePlan was not able to talk with all water suppliers.

Due to funding limitations, the original scope of this project was to look at Contra Costa, Marin, Alameda, and San Francisco county. Recognizing that water jurisdictions and county boundaries are not aligned, we acknowledge that we have also missed water suppliers within this limited scope. ClimatePlan hopes to expand this scope when researching implementation strategies as next steps for this project.

The overarching principles and recommendations in this report have been developed with these limitations and scope in mind. Overall, the effort to integrate water into Plan Bay Area 2050 will be essential because the regional plan allows for better coordination, which will in turn, better address the challenges the San Francisco Bay Area faces.

² "Proposition 26: Increases Legislative Vote Requirement." LA Law Library. (Web)
Retrieved from https://lao.ca.gov/ballot/2010/26_11_2010.aspx
https://www.lalawlibrary.org/pdfs/PROP_1102_26.pdf.

BACKGROUND

OVERVIEW OF THE SEPARATION OF LAND-USE AND WATER AGENCIES

Originally, early water right decisions were based on land ownership and whether water was on the land. If the water was on the land, owners of the land were allowed to use the water. With the increased demand of water (from mining, agricultural, urban users), California legislators and courts recognized “appropriative water rights,” which describe the right to divert water based on the time the right was created, and amount that was agreed upon. These individuals or groups who had gained water rights organized themselves locally to create irrigation districts and mutual water companies to build the infrastructure to divert water. These groups were legalized by the Wright Act of 1887, and were given responsibilities for acquiring water, acquiring funding, and constructing projects.^{3 4} While cities did expand their water supply during this time, water rights, and water agencies were developed separately.

Key Definitions

“Limited supply,” in this report, recognizes there is uncertainty in how much water is available and uses the term to highlight that the Bay Area should continue to prioritize conservation and water efficiency. Water agencies are more knowledgeable in terms of the actual quantity.

Displacement is defined in this report as a “forced or responsive move due to changes in one’s home or neighborhood, ie: rising rents, or changes in habitability.” Displacement arises when vulnerable populations are not involved in decisions that impact their communities.

Water unaffordability for this report is defined as both 1) the ability for residents to pay for their water bill; and 2) the ability for the water utility to meet conservation requirements and infrastructure maintenance.

This led land-use agencies (local governments and transportation agencies) and water agencies to have different political geographies, different funding budgets, and different priorities from each other.

³“Hanak et al. (2001) “Floods, droughts, and lawsuits: A brief history of California Water Policy.” Managing California’s Water: From Conflict to Reconciliation.” LA Law Library. (Web)

⁴ Hanemann, Dyckman, and Damian Park. (2015). “California’s Flawed Surface Water Rights.” Sustainable Water: Challenges and Solutions from California, ed. Allison Lassiter. Oakland: California, Regents of University of California.

Land-use agencies are further divided into local governments, who are in charge of land-use planning, and transportation agencies, who oversee projects that improve mobility in their city or county. The priorities of these agencies are to manage economic and population growth. While there are



This image illustrates the misalignment within some water agencies' jurisdictions and county boundaries. Source: Bay Area Integrated Regional Water Management Plan and Future Proof of Water.

examples of cities that are in charge of water distribution; in most cases, water agencies are separated from them. It should be noted that water utilities can also be further divided depending on the facility; there may be a separate utility that manages wastewater. But, generally, water utilities have different priorities than land-use agencies. Water agencies' priorities are to get drinking water to customers, divert water supplies responsibly, and keep up to date around water quality. Water agencies have different jurisdictions than the county or city boundary. Thus, water usually provide water for more than one county.

Because of this historic separation, each water utility and local government has their own budget. The different funding budgets are exacerbated by two laws: 1) Proposition 13, which regulates how much local governments can collect in property taxes; and 2) Proposition 218, which regulates how water agencies use the water rates they collect, and how much they can collect.⁵ These restrictions severely limit local governments' and water agencies' ability to maintain existing infrastructure, and implement the solutions to address challenges that the San Francisco Bay Area faces.

⁵ Hanak et al. (2014). "Paying for Water in California." Public Policy Institute of California. (Web). Retrieved from: <https://www.ppic.org/publication/paying-for-water-in-california/>.

Proposition 13 limits funding, which pushes land-use agencies to depend on developers for funding.⁶ Conversely, developers and land-use planners choose to rely on cheap land and expand transportation infrastructure making development spread further out.⁷ This causes land-use planners to create zoning regulations for sprawl development. These regulations are barriers to development that adheres to principles of smart growth⁸ and helps the region use water more efficiently.

Proposition 218 leaves water agencies with limited options to subsidize water for low-income communities and communities of color.⁹ All the Bay Area water agencies recognize the equity concerns and have a subsidy program for low income residents. Some water agencies will need additional support to help renters.



This is an image of sprawl development. Photo credit within Canva design.

REDLINING

Inequitable land-use policies, such as redlining, have further compounded these challenges on African American, and Latino communities.

Redlining, where African Americans were refused loans for homeownership or maintenance of infrastructure, led to severe resource disparities for

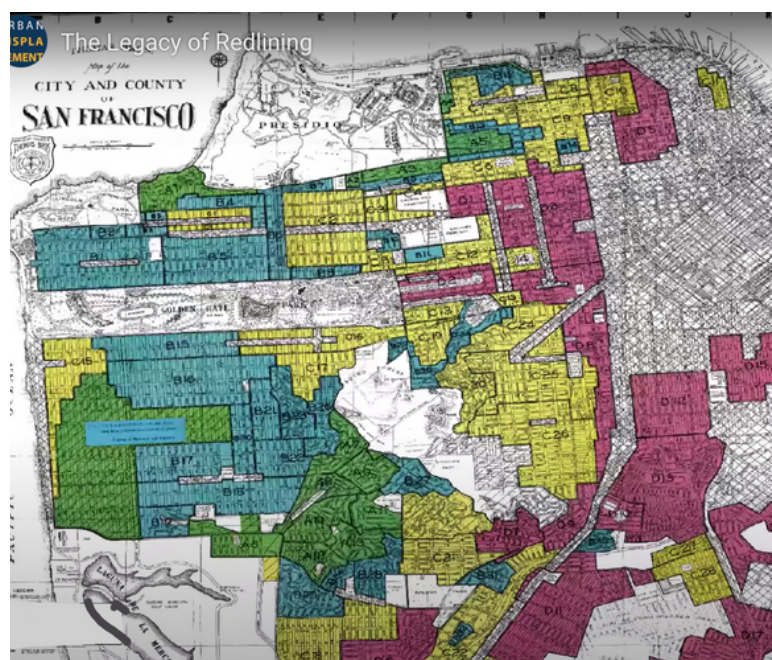
⁶ Bowles, L. K. and Nelson, A. C. (2008). "Capital Facility and Infrastructure Financing Options." Impact Fees & Housing Affordability: A Guide for Practitioners. Newport Partners LLC and Virginia Polytechnic Institute and State University. Retrieved from: <https://www.huduser.gov/portal/publications/impactfees.pdf>.

⁷ Brody, S. (2013). "The Characteristics, Causes, and Consequences of Sprawling Development Pattern in the United States." The Nature Education. (Web). Retrieved from: <https://www.nature.com/scitable/knowledge/library/the-characteristics-causes-and-consequences-of-sprawling-103014747/>.

⁸ See Appendix A for smart growth principles.

⁹ Hanak et al. (2014). "Paying for Water in California." Public Policy Institute of California (Web). Retrieved from: <https://www.ppic.org/publication/paying-for-water-in-california/>.

communities of color. This resource disparity was further compounded because local governments, transportation, and water agencies were prevented from coordinating their funding or decision-making. Whiter, wealthier communities saw improvements to housing, water utilities, and transportation, while poorer communities of color did not.



This image was pulled from the Urban Displacement Project. It illustrates redlining within San Francisco.

Redlining also led to inequitable placement of wastewater and transportation infrastructure. Wastewater and high polluting transportation infrastructure, such as highways, have typically been placed in communities of color. These communities are forced to bear the disproportionate burden of air pollution, respiratory diseases, and more because of the negative impacts from wastewater plants and highways.

THE CHALLENGES

LIMITED INTERAGENCY COORDINATION

Transportation and water agencies have **limited capacity** and **funding to engage** with each other.

PRIORITIZING DEVELOPMENT THAT USES WATER EFFICIENTLY

The current pattern of development in the San Francisco Bay Area is **less water efficient** than smart growth development

HOUSING UNAFFORDABILITY

59% of the median household income goes to **transportation** and **housing**. This **does not** account for water.

WATER UNAFFORDABILITY

Water bills are **increasing**. Water utilities must find a way to **balance** affordable rates and preparing for the drought.

Given the scope and overview, this report examines the following challenges:

1

LIMITED INTERAGENCY COORDINATION

Despite significant progress on this front, local governments, water agencies, and transportation agencies continue to make decisions independently from one another. **Transportation and water agencies have limited capacity and funding to engage with each other.** Community residents face accessibility barriers including the time and location of public engagement workshops, as well as lack of translation services.

The current pattern of development in the San Francisco Bay Area, especially in counties such as East Contra Costa, **is less water efficient than smart growth development.**^{10 11 12} However, it will be a challenge to incentivize smart growth development because Proposition 13 encourages sprawl development.

2

PRIORITIZING DEVELOPMENT THAT USES WATER EFFICIENTLY

¹⁰ Busch, C. Lew, E. and DiStefano, J. (2015). "Moving California Forward: How Smart Growth Can Help California Reach its 2030 Climate Target While Creating Economic and Environmental Co-benefits." Energy Innovation and Calthorpe Analytics. Retrieved from: <https://energyinnovation.org/wp-content/uploads/2015/11/Moving-California-Forward-Full-Report.pdf>.

¹¹ Green Belt Alliance. (2017). "At Risk: The Bay Area Greenbelt." Green Belt Alliance. Retrieved from <https://www.greenbelt.org/at-risk-2017/>.

¹² Resnick, D. B. (2010). "Urban Sprawl, Growth, and Deliberative Democracy." American Journal of Public Health, 100 (10), pp. 1852-1855.

3

HOUSING UNAFFORDABILITY

True Affordability

Currently, there is not enough affordable housing that meets the needs of low income or moderate income residents, and is near jobs. **The Urban Land Institute reports that 59% of the median household income goes to transportation and housing.**¹³ Moreover, there are specific equity concerns at the intersection of housing and transportation; there are communities disproportionately burdened by high housing costs, and are displaced.¹⁴ Thus, they are more likely to be affected by the lack of consideration of transportation costs within housing costs.

Housing -Water Nexus

In addition to housing and transportation, the cost of water should be considered. As shown by COVID-19, many communities were impacted by the cost of water, resulting in campaigns to suspend water shut off due to lack of payment. **While water rates themselves do not exacerbate housing costs, it is clear that if people are not able to afford water and the water is shut-off, the house is legally “inhabitable and untenable”.**¹⁵ This legal designation means that a resident can be evicted if they do not have water. Moreover, the uncertainty of water supply can be used to prevent development. Communities have found that low income housing has been denied because of a lack of water supply.

¹³ Urban Land Institute (2009). “Bay Area Burden: Examining the Costs and Impacts of Housing and Transportation on Bay Area Residents, their Neighborhoods and the Environment.” Urban Land Institute. Retrieved from <http://uli.org/wp-content/uploads/2012/05/Bay-Area-Burden-10-13.pdf>

¹⁴ Samara, T, R. and Martin, A. (2016). “Race, Inequality, and the Resegregation of the Bay Area.” Urban Habitat.

¹⁵ Feinstein, L. and Warner A. (2018). Water Service Disconnections in California [Factsheet]. Retrieved from <https://pacinst.org/wp-content/uploads/2019/03/Water-Service-Disconnections-in-California-Fact-Sheet-Pacific-Institute.pdf>

Water Rates

While water bills are the cheaper utility bill, it can be an additional burden to low income residents who are struggling to balance housing costs and transportation costs.¹⁶ This is essential to remember as 2000 to 2010 data showed water bills had increased two to three times more than inflation.¹⁷ This may be a challenge for low-income residents in particular. For water utilities, the challenge will be trying to keep low affordable water rates, while also having enough money to maintain infrastructure and prepare for the upcoming drought. This challenge is exacerbated by Proposition 218.

Development -Water Rates Nexus

Water affordability will also be affected by the policies for development. This is because policies for development, such as water neutral requirements, can shift the cost from developers to low-income residents. Water neutral requirements—also referred to as demand-offset programs—are requirements to decrease the impact that new development will have on water supplies; this can be done through conservation measures or by finding a different source of supply.¹⁸ Specifically, in-lieu fees—fees that developers pay instead of performing actual fixture replacements and other efficiency measures—can shift the cost of water efficiency upgrades to residents.¹⁹ This, without proper integration, can result in creating a disproportionate burden on the low income resident struggling to balance costs, who now have to take the upgrades themselves.



¹⁶ Feinstein, L. (2018, April) Water Affordability in California: Linking Affordability Indicators to Policy Decisions. Presented at Water Affordability Symposium, Sacramento CA.

¹⁷ Cooley, H., Donnelly, K., Soqo, S., and Bailey, C. (2016). "Drought and Equity in San Francisco Bay Area." Pacific Institute and Environmental Justice Coalition for Water.

¹⁸ Harder, J. L. (2014) "Demand Offsets; Water Neutral Development in California." McGeorge Law Review. 46. Retrieved from https://www.mcgeorge.edu/documents/Publications/8_Harder46_1.pdf.

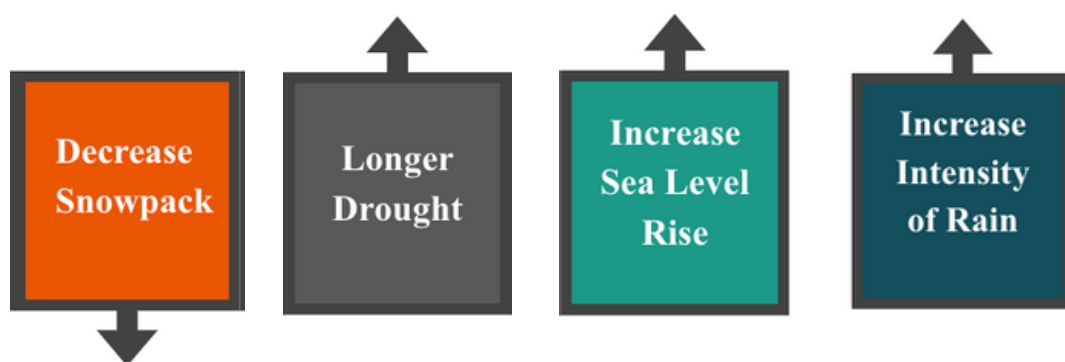
¹⁹ Christiansen, B. (2015). "Water Offset Policies for Water Neutral Community Growth: A Literature Review and Case Study Compilation." Alliance for Water Efficiency. Retrieved from: <https://www.allianceforwaterefficiency.org>.

Integration is needed so that:

- The Bay Area will be able to determine how to **prioritize development** while efficiently using their water supply.
- Local governments, transportation agencies, and water utilities **can share the responsibility and the burden of addressing the challenges**, making it more likely implementation will happen.
- Communities can effectively engage in coordinated and holistic water, land-use, and transportation decision-making that **addresses historic and current inequities**.

UPCOMING CHALLENGE: CLIMATE CHANGE

The impacts of climate change will further exacerbate the challenges listed above. Climate change will result in:



- 1** Decreases in snowpack: A reduction in snowpack will decrease the amount of water available as water supplies depend on snowpack to replenish.
- 2** Longer droughts: Longer droughts will reduce the amount of water available. If there is no action taken, multiple drought years in the region as a whole would result in water suppliers being 21% short in meeting demand.²⁰ Drought will also affect recycled water supply because conservation measures will reduce the amount of water available for reuse and for the environment.

²⁰ SPUR (2013). "Future-Proof Water: Where the Bay Area Should Get Its Water in the 21st Century." SPUR. Retrieved from <https://www.spur.org/publications/spur-report/2013-03-18/future-proof-water>.

3 Increases in the intensity of rain: An increasing intensity of rain can mean more flooding.²¹ Flooding will destroy water supply infrastructure and housing infrastructure, leaving communities without potable drinking water, and without homes.

4 Rise of sea level: Rising sea levels affect salinity and the water quality of Californian water supplies.²² More specifically, sea level rise may increase the salinity of the Sacramento-San Joaquin Delta and coastal aquifers because salt water can intrude the water supply as sea level rises. These are major sources of supply for water agencies in the Bay Area, one of which is entirely dependent on the supply.^{23 24} The increase in salinity and decrease of water quality are two of the many factors that will affect the amount of water available for drinking. These costs will be placed on water utility customers. Furthermore, any affordable housing in places that are threatened by sea level rise is more likely to experience flooding multiple times.²⁵

In addition to the impacts listed above, climate change will exacerbate the challenges shared in the previous section in the following ways:

- Water Supply Management and Development
 - Climate change will result in further limitations on water, which means that land-use agencies will have to seriously consider how to make development more water efficient; and water agencies will have to continue to be creative and holistic when managing the supply of water. This is because solutions that may help the region be prepared for climate change may have inadvertent consequences. For example, recycled water systems use the limited water supply more efficiently, but can cause infrastructure damage because of conservation

²¹ Chappelle, C., McCann, H., Jassby, D., Schawabe, K., and Szeptycki, L. (2019). "Managing Wastewater in a Changing Climate." Public Policy Institute of California. Retrieved from <https://www.ppic.org>.

²² Mount et. al. (2018). "California's Water: Climate Change and Water." PPIC Water Policy Center. Web. Retrieved from <https://www.ppic.org/publication/californias-water-climate-change-and-water/>.

²³ Alameda County Water District. (n.d). "ACWD's Water Sources and Supplies." Alameda County Water District. Web. Retrieved from <https://www.acwd.org/100/ACWDs-Water-Sources-Supplies>.

²⁴ Contra Costa Water District. (n.d). "The Source of Your Water: Where the Water Comes From." Contra Costa Water District. Web. Retrieved from <https://www.ccwater.com/365/The-Source-of-Your-Water>.

²⁵ Spanger-Siegfried et al. (2017). "When Rising Seas Hit Home: Hard Choices Ahead for Hundreds of US Coastal Communities." Union of Concerned Scientists. Retrieved from: www.ucsusa.org/resources/when-rising-seas-hit-home.

measures. Conservation measures—because of the preparation for drought—limits the amount of wastewater available, because less water is used. Then, less water is available to flush minerals down the pipe, which can cause build up and infrastructure damage.²⁶

- Water and Housing Affordability:

- Climate change will limit current water supply and increase the likelihood of flooding. Homeowners will need to invest in infrastructure upgrades and flood insurance, which adds to the cost of homeownership. Water utilities also need to invest in infrastructure upgrades, build new infrastructure, or create new water transfer agreements; these could increase water rates for customers.
- Sea level rise will create additional housing and water affordability challenges. Sea level rise can increase the risk of flooding of critical infrastructure like roads, hospitals, and schools. Replacing property at risk has been estimated to cost \$49 billion (in 2000).²⁷ These costs may be passed on to taxpayers.



This is an image of sea level rise Photo credit within Canva design.

Climate change will also have additional impacts around safety and health, which are included in Appendix B.

Ultimately, climate change will have two effects: limit current water supply (due to decrease in snowpack, longer droughts, sea level rise); and increase the likelihood of flooding (due to intense rain and sea level rise). This in turn will make it harder to address the current challenges of the San Francisco Bay Area. **Better integrating water and climate resilience into the regional transportation plan will continue to strengthen the efforts to address these challenges.**

²⁶ Chappelle, C., McCann, H., Jassby, D., Schawabe, K., and Szeptycki, L. (2019). "Managing Wastewater in a Changing Climate." Public Policy Institute of California. Retrieved from <https://www.ppic.org>.

²⁷ Herberger, M., Cooley, H., Moore, E., and Herrera, P. (2012). "The Impacts of Sea Level Rise on the San Francisco Bay." Pacific Institute.

WHAT HAS MTC AND ABAG DONE

The Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) have recognized the importance of connecting water to land-use and transportation planning.

MTC and ABAG are currently assessing how they can integrate water into Plan Bay Area 2050. Through their Horizon Initiative, they began building the foundation to include water in Plan Bay Area 2050 and will continue to have this dialogue with water agencies. Below are a portion of the strategies related to development, housing, the economy, water, transportation, and the environment that MTC and ABAG may include in Plan Bay Area 2050.

Transportation	Housing	Economy	Water	Environment
<ul style="list-style-type: none"> ■ Operate and maintain the existing system. ■ Build a complete streets network. ■ Advances low-cost transit projects. 	<ul style="list-style-type: none"> ● Allow a greater mix of housing types and densities in growth areas. ● Transform aging malls and office parks into neighborhoods. ● Require 10-20% of all new housing to be affordable. ● Reduce barriers to housing near transit and areas of high opportunity. 	<ul style="list-style-type: none"> ● Allow greater commercial densities in growth geographies. ● Expand childcare support for income families. 	<ul style="list-style-type: none"> ● Explore ways to support better coordination of land-use and water planning. ● Modernize existing buildings with seismic, wildfire, drought, and energy retrofits. ● Maintain urban growth boundaries. 	<ul style="list-style-type: none"> ● Protect high-value conservation lands. ● Adapt to sea level rise. ● Expand the Climate Initiatives Program.

The table illustrates the actions that MTC and ABAG are considering for Plan Bay Area 2050.

To provide a fuller picture of all the actions taken around this important issue, Appendix C outlines a list of actions taken by local water agencies, Bay Area cities, and the state government to integrate water into land-use, transportation, housing, and climate.

Clearly, MTC has started the work to equitably integrate water into Plan Bay Area 2050; These specific actions address the challenges raised above; the dialogue with water agencies, the action to reduce barriers to housing near transit, and the action to modernize existing buildings with seismic, wildfire, drought, and energy retrofits.

RECOMMENDATIONS

OVERARCHING PRINCIPLES AND STRUCTURAL CHANGES NEEDED

Below, ClimatePlan recommends the following principles to better integrate water into land-use, transportation, climate, and housing. These principles may aid MTC's and ABAG's effort to include water supply into the regional transportation document.

- 1** MTC should prioritize growth in high resource and high transit areas, and should not fund projects that lead to growth in areas that are:
 - Threatened by sea level rise, or flooding.
 - Displaces existing low-income affordable households.
 - Converting open space and agricultural resources to urban uses.
- 2** MTC should coordinate with water agencies to align funding and planning when possible.
 - Goal: Affordable housing should be close to transportation, and community participation should be in every aspect. This process ensures water is used efficiently.

These principles together address the four current challenges and the one upcoming challenge that this report elevates.

**MTC SHOULD
PRIORITIZE GROWTH
IN HIGH TRANSIT/
HIGH RESOURCE
AREAS AND NOT FUND
PROJECTS UNDER 3
CONDITIONS**

☒ **Prioritizing development that uses water efficiently:** this strategy creates incentives for development in developed areas and limits development in the Bay Area's natural lands. As mentioned previously, this development is more water efficient than sprawl development.

☒ **Housing unaffordability:** this strategy will create housing near transit, which can begin to address the transportation and housing cost burden.

☒ **Limited interagency coordination:** Being more proactive in coordination can create space for water agencies and transportation agencies to collaborate.

☒ **Water unaffordability:** this strategy will may support water agencies with some of the costs that are not traditionally considered; for example, pipe upgrades are not considered when projects apply for redevelopment.

**MTC SHOULD
COORDINATE WITH
WATER AGENCIES TO
ALIGN FUNDING AND
PLANNING WHEN
POSSIBLE**

REGIONAL HOUSING NEEDS ALLOCATION AND HOUSING ELEMENT OF GENERAL PLANS

To better address the intersections of water supply, water affordability, housing affordability, and development, ClimatePlan is providing the following recommendation for the Regional Housing Needs Assessment (RHNA), a clear tool that ABAG could leverage to ensure there is enough housing available and create more conversations around water supply.

BACKGROUND

The Regional Housing Needs Allocation (RHNA) is a process mandated by the state to ensure that residents at all levels of income (very low income, low income, moderate income, and above moderate income) have housing. And because of recent legislation, RHNA encourages condensed development. However, the structures of RHNA lack the ability to adequately limit growth based on water supply. The current conversations around water supply in RHNA only look at water infrastructure (is there water capacity here), without looking at water resilience (how do we best use the supply that we have). Further, metropolitan planning organizations (MPOs) are only responsible for distributing the allocation numbers once they receive it from the Department of Housing Community Development (HCD). Local land-use jurisdictions then update their housing element in the general plan to meet the allocation numbers the MPOs assign to them.

The housing element is one section of the general plan, a required land-use document that cities and counties develop to frame their development goals and relative policies. The housing element is required to be updated every five to eight years, and it is a city's plan to build housing for all income levels.

The following is the requirement for the housing element to consider water: "Chapter 727 now requires cities and counties to immediately deliver the adopted housing elements of the local general plan and any amendments to water and sewer providers. Water and sewer providers have to adopt policies and producers no later than..." a specified date.²⁹

²⁹ Governor's Office of Planning and Research. (2017). "State of California General Plan Guidelines." Office of Planning and Research. (Web). Retrieved from <http://opr.ca.gov/planning/general-plan/guidelines.html>.

RECOMMENDATION FOR RHNA

Limited supply: MPOs should work with HCD, local jurisdictions, equity advocates, water agencies, and all other stakeholders **to develop guidelines** for housing allocation numbers in the case that water supply is severely limited. These guidelines should define "severely limited" as it relates to water to the best of the group's ability.

RECOMMENDATION FOR THE HOUSING ELEMENT

Limited supply: These RHNA guidelines should also be reshaped to instruct on how to produce housing in areas with limited water supply; these guidelines should also ensure water supply does not contribute to anti-growth sentiment.

CONCLUSION AND NEXT STEPS

The integration of water into land-use, transportation, housing, and climate decision making is vital to address the current and upcoming challenges the Bay Area faces. MTC and ABAG have made significant headways to address these challenges. The recommendations are to aid MTC and ABAG efforts in better coordinating and equitably integrating water, land-use, transportation, housing, and climate.

The next steps in this effort will be to work with the organizations listed in this report to develop actionable implementation strategies.

²⁹ Creswell, C. (2006, May 26). Senate Bill 1087, legislation effective January 1, 2006: Water and Sewer Service Priority for Housing Affordable to Lower Income Households. [Memorandum]. Department of Housing and Community Development. Retrieved from https://www.hcd.ca.gov/community-development/housing-element/housing-element-memos/docs/memo_sb1087.pdf.

APPENDIX A: GUIDING PRINCIPLES FOR SMART, SUSTAINABLE, EQUITABLE GROWTH

Smart growth development has three benefits to the Bay Area's water supply: 1) it consumes less water because water is not used for watering landscapes and lawns, 2) it increases water quality because streets tend to be conduits of pollution, and 3) it allows for more natural land to be available for natural groundwater replenishment.^{30 31 32}

The following are ClimatePlan's principles to smart growth:

- Advance Pragmatic Policy Solutions: Policy solutions should be both visionary and pragmatic, advancing innovative ideas and best practices, while being grounded in the reality of existing trends.
- Find Common Ground: Focusing on shared priorities and areas of common ground is the best way to achieve our goals. We are committed to bringing together diverse stakeholders around policy solutions that will help all our partners advance their goals.
- Build a Long-Lasting Movement: All communities and regions should have informed, engaged organizations that are working to monitor and shape growth over the long term. We work to build enduring capacity among local smart growth advocates.
- Promote Policies that Protect and Improve Public Health: We advocate for policies that promote walking, bicycling, and reduced driving, resulting in more active lifestyles, better air quality, and safer streets.
- Advance Solutions that Increase Social Equity and Environmental Justice: All communities, particularly low-income communities, must have the opportunity to benefit from growth. We advance policies that address mobility, jobs, and affordability, and protect existing residents and local businesses from displacement.
- Protect Areas Where Growth Should Not Occur: Forests, agricultural areas, important watershed areas, and wildlife habitat should be protected from development. We promote policy tools that quantify

³⁰ Busch, C. Lew, E. and DiStefano, J. (2015). "Moving California Forward: How Smart Growth Can Help California Reach its 2030 Climate Target While Creating Economic and Environmental Co-benefits." Energy Innovation and Calthorpe Analytics. Retrieved from: <https://energyinnovation.org/wp-content/uploads/2015/11/Moving-California-Forward-Full-Report.pdf>.

³¹ Green Belt Alliance. (2017). "At Risk: The Bay Area Greenbelt." Green Belt Alliance. Retrieved from <https://www.greenbelt.org/at-risk-2017/>.

³² Resnick, D. B. (2010). "Urban Sprawl, Growth, and Deliberative Democracy." American Journal of Public Health, 100 (10), pp. 1852-1855.

the GHG benefits of preserving these areas and create incentives for preservation.

- Increase Community Participation in Planning: Planning at both the local and regional levels is more effective when there is meaningful community participation throughout the process. In particular, under-represented communities need to be engaged in long-term planning.
- Help Local Governments Move Ahead: Cities, counties and MPOs need financial support to plan and implement VMT reduction strategies. We are committed to establishing, restoring, and expanding funding for these efforts.
- Amplify Synergies: We strive to connect smart growth campaigns to add value to the work of organizations at all levels, from the neighborhood to the national.

APPENDIX B: CLIMATE CHANGE IMPACT ON HEALTH AND SAFETY

- Development and urban heat islands: With increasing temperatures from climate change, local decision makers need to ensure that development is not contributing to the urban heat island effect. The urban heat island effect is when the roofs, streets, and sidewalks in a built-up area absorb heat during the day and re-radiate it, sometimes well into the night, so that heat lingers and accumulates. This increased temperature not only has human health effects, it can indirectly impact water supply and directly affects water quality. According to the Environmental Protection Agency's website:³³
 - Human health effects: The health effects from the radiation from heated pavements include general discomfort, respiratory difficulties, heat cramps and exhaustion, non-fatal heat stroke, and heat-related mortality.
 - Water quality: Heated pavement and rooftop surfaces from the urban heat island effect can elevate stormwater run-off to roughly 70°F (21°C) to over 95°F (35°C). Warmer stormwater run-off can affect the ecosystem of the wetland when the water returns to it. This may affect the ecosystem's ability to sustain itself and provide flood protection benefits.

³³ EPA. (n.d). "Urban Heat Island Impacts." United States Environmental Protection Agency. (Web). Retrieved from: <https://www.epa.gov/heat-islands/heat-island-impacts>.

Climate change will bring hotter summers to the San Francisco Bay Area. The solutions that address the urban heat island effect, such as investing in natural and working land solutions such as tree canopies, also address stormwater management as well.³⁴

- Water management, development, and environmental health: The protection of our watersheds not only provides benefits of flooding protection, it creates better water quality.³⁵ Development and limited water supply has created an either/or scenario, which is a decision that can no longer be framed in that context.

APPENDIX C: ACTIONS TO INTEGRATE BY OTHER ACTORS

The following is a list of actions and the agencies who were responsible. The list is mainly looking at the actions taken by local water agencies, cities in the San Francisco Bay Area, and the California state government. Subsequently, this list has the policies in place to integrate water into land-use, housing, and climate

- Collecting more data: Collecting more data has allowed for better planning because there is more information on consequences of planning decisions.
 - Contra Costa Water District has completed an affordability study when raising water rates. (Contra Costa Water District).
 - MTC has examined the feasibility of constructing affordable housing on public lands (MTC and technical advisory committee).³⁶
 - Bay Area Spatial Information System: data-base that includes development policies, where wetlands are, etc.
- Increasing community outreach and inclusion in decision making processes: Outreach and inclusion ensures that all communities have the same access to benefits and no community has to disproportionately bear consequences like pollution.
 - East Bay Municipal Utility District conducts outreach to the community affected by their wastewater plant (EBMUD).

³⁴ SPUR (2006). “Integrated Stormwater Management.” SPUR. (Web). Retrieved from <https://www.spur.org/publications/spur-report/2006-11-07/integrated-stormwater-management>.

³⁵ EPA. (n.d). “Benefits of Healthy Watersheds.” United States Environmental Protection Agency. (Web). Retrieved from: <https://www.epa.gov/hwp/benefits-healthy-watersheds>.

³⁶ Smith, D., Nimon, M., and Kieser, W. (2018). Technical Memorandum: MTC Workforce Housing Action Plan. [Memorandum]. Metropolitan Transportation Commission. P:\151000s\151079_MTC_Housing\Report\EPS_ActionPlan091118.docx.

- All water utilities host a public decision making process for rate setting
- Strengthening coordinated regional planning
 - Seven water agencies in the Bay Area have created a drought contingency plan where water utilities voluntarily work together to create water transfer agreements or fund projects to increase water supply.
 - Integrated Regional Water Management Plan: A voluntary plan established under SB 1672 (Costa). Various local decision makers, community, environmental water agencies, and tribes get together to implement water management on a regional scale.³⁷ The Bay has an extensive IRWM that describes regions' challenges, the strategies they want to pursue, financing options, and coordination.³⁸
- Strengthening the connections between water supply and decisions in development:
 - General plans and urban water management plans (UWMP): The general plan documents land-use, growth, and development, and urban water management plan assesses water sources over a 20-year time frame for water reliability, to project water demands, and to plan how they will meet this demand.^{38 39} Land-use agencies work with water suppliers to get input about water supplies. For UWMP, water agencies project water supply needs and continue to find ways to reduce per capita use to 55 gallons per day. Urban and agricultural users will also have to create water budgets and send in reports to the State Water Board.⁴⁰

³⁷ Department of Water Resources.(2017). "Stakeholder Perspectives: Recommendations for Sustaining and Strengthening Integrated Regional Water Management." Department of Water Resources. Web. Retrieved from: <https://water.ca.gov>.

³⁸ Kennedy/Jenks Consultants in association with Environmental Science Associates; Kearns and West; and Zentraal (2013). "San Fran Bay Area Integrated Regional Water Management Plan." Web. Retrieved from <http://bayareairwmp.org/irwm-plans/>.

³⁸ Governor's Office of Planning and Research. (2017). "State of California General Plan Guidelines." Office of Planning and Research. (Web). Retrieved from <http://opr.ca.gov/planning/general-plan/guidelines.html>.

³⁹ Department of Water Resources. (n.d.). "Urban Water Management Plans." California Department of Water Resources. Web. Retrieved from: <https://water.ca.gov/>.

⁴⁰ California Department of Water Resources (DWR), State Water Resource Control Board (SWRCB), California Public Utilities Commission (CPUC), California Department of Food and Agriculture (CDFA), and California Energy Commission (CEC). "Making Water Conservation a California Way of Life: Implementing Executive Order B-37-16." DWR, SWRCB, CPUC, CDFA, and CEC. Retrieved from: https://water.ca.gov/LegacyFiles/wateruseefficiency/conservation/docs/20170407_EO_B-37-16_Final_Report.pdf

- SB 610 and SB 221 “Show me the water:” Legislation that requires developers to submit a water supply assessment to water suppliers, and they have to provide written confirmation of the water supply.⁴¹ Depending on the water supplier, they would be able to deny development; and if they are not able to, utility connection fees and system capacity charges would be able to regulate development.
- Sustainable Groundwater Management Act (SGMA): Legislation that requires water agencies and local decision makers to develop and implement plans for sustainable groundwater use and replenishment.⁴²

³⁸ Governor’s Office of Planning and Research. (2017). “State of California General Plan Guidelines.” Office of Planning and Research. (Web). Retrieved from <http://opr.ca.gov/planning/general-plan/guidelines.html>.

³⁹ Department of Water Resources. (n.d.). “Urban Water Management Plans.” California Department of Water Resources. Web. Retrieved from: <https://water.ca.gov/>.

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⁴¹ Hanak, E. (2010). “Show Me the Water Plan: Urban Water Management Plans and California’s Water Supply Adequacy Laws.” Golden Gate U. Env’tl. L.J., 4 (5), Retrieved from: <http://digitalcommons.law.ggu.edu/gguelj/vol4/iss1/5>.

⁴² Department of Water Resources. (n.d.). “SGMA Groundwater Management.” California Department of Water Resources. Web. Retrieved from <https://water.ca.gov/>.

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