

APPENDIX A:  
COMMENT LETTERS





# COMMENT LETTER # 1

STATE OF CALIFORNIA

EDMUND G. BROWN JR., *Governor*

## PUBLIC UTILITIES COMMISSION

320 WEST 4TH STREET, SUITE 500  
LOS ANGELES, CA 90013  
(213) 576-7083



Clear  
12/09/13  
E

December 2, 2013

Tyra Hays  
City of Vacaville  
650 Merchant Street  
Vacaville, CA 95688

RECEIVED

DEC 02 2013

STATE CLEARING HOUSE

Dear Tyra:

Re: SCH 2011022043 Vacaville General Plan – DEIR

The California Public Utilities Commission (Commission) has jurisdiction over the safety of highway-rail crossings (crossings) in California. The California Public Utilities Code requires Commission approval for the construction or alteration of crossings and grants the Commission exclusive power on the design, alteration, and closure of crossings in California. The Commission Rail Crossings Engineering Section (RCES) is in receipt of the draft *Environmental Impact Report (DEIR)* for the proposed City of Vacaville (City) General Plan project.

1-1

The project area includes active railroad tracks. RCES recommends that the City add language to the General Plan so that any future development adjacent to or near the railroad/light rail right-of-way (ROW) is planned with the safety of the rail corridor in mind. New developments may increase traffic volumes not only on streets and at intersections, but also at at-grade crossings. This includes considering pedestrian/bike circulation patterns or destinations with respect to railroad ROW and compliance with the Americans with Disabilities Act. Mitigation measures to consider include, but are not limited to, the planning for grade separations for major thoroughfares, improvements to existing at-grade crossings due to increase in traffic volumes and continuous vandal resistant fencing or other appropriate barriers to limit the access of trespassers onto the railroad ROW.

1-2

If you have any questions in this matter, please contact me at (213) 576-7076, [ykc@cpuc.ca.gov](mailto:ykc@cpuc.ca.gov).

1-3

Sincerely,

Ken Chiang, P.E.  
Utilities Engineer  
Rail Crossings Engineering Section  
Safety and Enforcement Division

C: State Clearinghouse

# COMMENT LETTER # 2

## DEPARTMENT OF TRANSPORTATION

111 GRAND AVENUE  
OAKLAND, CA 94612  
PHONE (510) 286-6053  
FAX (510) 286-5559  
TTY 771

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DEC - 9 2013

PLANNING DIVISION



*Flex your power!  
Be energy efficient!*

December 4, 2013

SOLGEN094  
SCH #2011022043

Ms. Tyra Hays  
City of Vacaville  
650 Merchant Street  
Vacaville, CA 95688

Dear Ms. Hays:

### **City of Vacaville General Plan and Energy and Conservation Action Strategy – Draft Environmental Impact Report**

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the project referenced above. We have reviewed the Draft Environmental Impact Report (DEIR) and have the following comments to offer.

2-1

#### ***Community Planning***

Section 4.14 – Transportation Demand Management measures should be included in the mitigation matrix for reducing traffic demand on the State Highway System (SHS).

2-2

Page 4.14-40 – Widening of intersections and roadways may result in higher motorist speeds and longer crosswalks. Include a discussion on secondary impacts to pedestrians and bicyclists that could result from proposed road and intersection widening.

2-3

In addition to multimodal goals and Transportation Demand Management policies (TR-7 – TR-10), consider parking strategies to further reduce traffic demand on the SHS. See the Metropolitan Transportation Commission's Toolbox/Handbook on Reforming Parking Policies ([http://www.mtc.ca.gov/planning/smart\\_growth/parking/parking\\_seminar/Toolbox-Handbook.pdf](http://www.mtc.ca.gov/planning/smart_growth/parking/parking_seminar/Toolbox-Handbook.pdf)) for guidance.

2-4

#### ***Traffic Safety***

On all proposed traffic mitigation measures on Interstate (I-) 80 and I- 505, please make sure that all signal warrants are required for the signal intersections. Signal warrants shall comply with the requirements as shown in the latest edition of California Manual on Uniform Traffic Control Devices. Double turning lanes should be provided to accommodate turning demand traffic volume which are 300 vehicles per hour or more. Proposed turning lanes shall be designed to allow for truck turning movements.

2-5

**Traffic Operations**

Page 4.14-15 – under the Section in Roadways, it states that the “levels of service for roadway links were estimated based on the 2009 Florida Department of Transportation (FDOT) methodology.” What was the reason for using FDOT’s methodology? The DEIR also mentions that the methodology was based on the Highway Capacity Manual (HCM). Was it based on the newer HCM 2010? The procedures contained in the 2010 update of the Highway Capacity Manual should be used as a guide for your analysis. Mitigation measures from prospective projects and future developments involving modifications and lane additions to the ramp terminals should be coordinated with Caltrans.

2-6

**Traffic Impact Fees**

To ensure that the SHS can facilitate and fund improvements necessary from the increased demand, we recommend the City work with the Solano Transportation Authority (STA) to implement the proposed Regional Transportation Impact Fee (RTIF) to help mitigate any impacts resulting from the proposed plan. Please also identify other traffic impact fees to be used for plan mitigation. Development plans should require traffic impact fees based on projected traffic and / or based on associated cost estimates for transportation facilities necessitated by development. Scheduling and costs associated with planned improvements on the State right-of-way should be listed, in addition to identifying viable funding sources correlated to the pace of improvements for roadway improvements, if any.

2-7

Should you have any questions regarding this letter, please contact Keith Wayne of my staff by telephone at (510) 286-5737, or by email at [Keith\\_Wayne@dot.ca.gov](mailto:Keith_Wayne@dot.ca.gov).

2-8

Sincerely,



ERIK ALM, AICP  
District Branch Chief  
Local Development – Intergovernmental Review

c: Scott Morgan, State Clearinghouse



State of California – The Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
Bay Delta Region  
7329 Silverado Trail  
Napa, CA 94558  
(707) 944-5500  
[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

EDMUND G. BROWN JR., Governor  
CHARLTON H. BONHAM, Director



December 9, 2013

RECEIVED  
DEC 10 2013  
VACAVILLE  
PLANNING DIVISION

Ms. Tyra Hays  
City of Vacaville  
650 Merchant Street  
Vacaville, CA 95688

Dear Ms. Hays:

Subject: City of Vacaville General Plan and Energy and Conservation Action Strategy, Draft Environmental Impact Report, SCH #2011022043, City of Vacaville, Solano County

This letter is intended to summarize the California Department of Fish and Wildlife's (CDFW) concerns regarding the botanical, wildlife and fisheries impacts associated with the City of Vacaville General Plan and Energy and Conservation Action Strategy (Plan) draft Environmental Impact Report (EIR) for future development in the City of Vacaville (City).

The City of Vacaville is located in Solano County between the cities of Dixon and Fairfield. The City lies 27 miles southwest of the City of Sacramento and 46 miles northeast of the City of San Francisco. Interstate 80 runs through the middle of the City, connecting Vacaville to the core of the Bay Area to the southwest, and to the Sacramento metropolitan area to the northeast. Interstate 505 branches off Interstate 80 and connects to Interstate 5 to the north.

The proposed Plan addresses growth within the City to the horizon year of 2035. The proposed Plan would replace the existing Plan, which was adopted in 1990 and amended through 2013. This draft EIR provides a general review of the environmental effects of future development activities and City actions based on proposed land use designations. This draft EIR will be used to evaluate the direct and indirect environmental effects of subsequent development under the General Plan Update (i.e., residential development, rezoning, commercial structures, park sites, recreation facility development, and infrastructure improvements). This draft EIR also assesses the proposed Vacaville Energy and Conservation Action Strategy (ECAS), which outlines strategies to reduce greenhouse gas emission.

3-1

CDFW is identified as a Trustee Agency pursuant to the California Environmental Quality Act (CEQA) Section 15386 and is responsible for the conservation, protection, and management of the State's biological resources. CDFW considers the draft EIR as a means to understand this growth while also developing adequate conservation and protection measures to conserve some of the City's biological natural resources.

*EIR Scope, Issues, and Concerns (Section B)*

The Plan states this EIR is a program level-EIR, and as such, it does not evaluate the impacts of specific, individual developments. Each specific future project will require separate environmental review, as required by CEQA, to secure the necessary discretionary development permits. The Plan further states that subsequent environmental review may be

3-2

tiered off of this EIR. CDFW recognizes that, pursuant to CEQA Guidelines Section 15152 subdivision (c), where a lead agency is using the tiering process in connection with an EIR for a large-scale planning approval such as a general plan, the development of detailed, site-specific information may not be feasible but can be deferred. In many instances, it can be deferred until such time as the lead agency prepares a future environmental document in connection with a project of a more limited geographical scale, as long as deferral does not prevent adequate identification of significant effects of the planning approval at hand. Based on CEQA Guidelines Section 15183.3 and associated *Appendix N Checklist*, the EIR should include a clear procedure for evaluating future projects based on biological resources.

3-2  
cont.

*Lake and Streambed Alteration Agreement*

As correctly identified in the draft EIR, any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed, CDFW may require a Lake and Streambed Alteration Agreement (LSAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant. CDFW, as a Responsible Agency under CEQA, will consider the CEQA document for the project. To obtain information about the LSAA notification process, please access our website at <http://www.dfg.ca.gov/habcon/1600/> or to request a notification package, contact CDFW's Bay Delta Regional Office at (707) 944-5500.

3-3

*California Endangered Species Act*

As correctly identified in the draft EIR, a California Endangered Species Act (CESA) Permit must be obtained if the project has the potential to result in take of species of plants or animals listed under CESA, either during construction or over the life of the project. A CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the Project will impact CESA listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA Permit.

3-4

CDFW appreciates the opportunity to provide comments on the draft EIR and is available to meet with you to further discuss our concerns. If you have any questions, please contact Ms. Lorie Hammerli, Environmental Scientist, at (707) 944-5568; or Ms. Karen Weiss, Senior Environmental Scientist (Supervisory), at (707) 944-5525.

3-5

Sincerely,



Scott Wilson  
Acting Regional Manager  
Bay Delta Region

cc: State Clearinghouse



Edmund G. Brown Jr.  
Governor

STATE OF CALIFORNIA  
Governor's Office of Planning and Research  
State Clearinghouse and Planning Unit



Ken Alex  
Director

December 10, 2013

Tyra Hays  
City of Vacaville  
650 Merchant Street  
Vacaville, CA 95688

Subject: General Plan and Energy and Conservation Action Strategy  
SCH#: 2011022043

Dear Tyra Hays:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on December 9, 2013, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

"A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

4-1

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Scott Morgan  
Director, State Clearinghouse

Enclosures

cc: Resources Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044  
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

**Document Details Report  
State Clearinghouse Data Base**

**SCH#** 2011022043  
**Project Title** General Plan and Energy and Conservation Action Strategy  
**Lead Agency** Vacaville, City of

**Type** EIR Draft EIR

**Description** This DEIR provides an assessment of the proposed City of Vacaville General Plan, published as a Draft for Public Review concurrently with this DEIR on October 25, 2013. The proposed General Plan replaces the City's existing General Plan, which was originally adopted in August 1990 and amended through 2013. The proposed General Plan is intended to guide development and conservation in the city through 2035. This DEIR also assesses the proposed Vacaville Energy and Conservation Action Strategy (ECAS). The proposed ECAS outlines strategies to reduce GHGE in compliance with the 2006 Global Warming Solutions Act.

**Lead Agency Contact**

**Name** Tyra Hays  
**Agency** City of Vacaville  
**Phone** (707) 449-5366 **Fax**  
**email** thays@cityofvacaville.com  
**Address** 650 Merchant Street  
**City** Vacaville **State** CA **Zip** 95688

**Project Location**

**County** Solano  
**City** Vacaville  
**Region**  
**Lat / Long**  
**Cross Streets** Citywide  
**Parcel No.**  
**Township**

**Range** **Section** **Base**

**Proximity to:**

**Highways**  
**Airports** Nut Tree, Travis AFB  
**Railways** CA Northern RR  
**Waterways** Alamo, Ulatis, New Alamo, Gibson Canyon and Creeks; Putah Canal  
**Schools** VUSD, TUSD, FUSD, DUSD  
**Land Use** 1990 General Plan

**Project Issues** Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Economics/Jobs; Fiscal Impacts; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Growth Inducing; Landuse; Cumulative Effects; Other Issues; Aesthetic/Visual

**Reviewing Agencies** Resources Agency; Department of Conservation; Department of Fish and Wildlife, Region 3; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 4; Department of Housing and Community Development; Air Resources Board; Regional Water Quality Control Bd., Region 5 (Sacramento); Native American Heritage Commission; Public Utilities Commission

**Date Received** 10/25/2013 **Start of Review** 10/25/2013 **End of Review** 12/09/2013

4-1  
cont.

# SOLANO COUNTY WATER AGENCY



November 19, 2013

Tyra Hays  
Senior Planner, General Plan Update Project Manager  
Vacaville Community Development Department  
City Hall, 650 Merchant Street  
Vacaville, CA 95688

RE: City of Vacaville General Plan Update

Dear Ms. Hays

On behalf of the Solano County Water Agency (Water Agency), we appreciate the opportunity to comment on the City’s General Plan update. As you are aware, the Water Agency has been developing a County-wide Habitat Conservation Plan (HCP), which the City of Vacaville is part of. The General Plan update appears to follow the draft conservation measures in the HCP. We do have a few comments where we have noticed some discrepancies. Those comments are detailed below.

5-1

Section 2-Land Use Element  
Page-LU-26  
Policy LU-P2.4

Require that development in the East of Leisure Town Road Growth Area purchase conservation easements to permanently protect lands within the Permanent Agriculture Overlay Area at a ratio of 1 acre of conserved agricultural land per 1 acre of developed agricultural land. If for any reason an adequate amount of agricultural conservation land cannot be identified or acquired within the Permanent Agriculture Overlay Area, the City and the Solano Land Trust, or if the Solano Land Trust declines to participate, the City and another land conservation entity, shall meet and confer to identify other areas located within 1 mile of the eastern boundary of the Permanent Agriculture Overlay Area where conservation acquisitions can occur to satisfy the conservation goals described in this section. (2.1-14)

5-2

Comment: For projects that will occur under the HCP (all new development projects and Vacaville’s operations and maintenance activities once the HCP is adopted) that affect



habitat, mitigation will occur at the prescribed ratios (HCP Section 6-Mitigation Measures), at either an approved mitigation bank, at a private, project-specific mitigation area, or through an approved conservation easement. In the case of the latter two methods, conservation easements will be held by the Water Agency for all projects under the HCP. Once Vacaville adopts the HCP, as required for all Solano Project member agencies, all conservation measures in the HCP must be adhered to.

**5-2  
cont.**

Page-LU-26  
Policy LU-P2.6

Lands designated Public Open Space that are converted to developed urban use shall be compensated for by providing equal or better lands for a similar use in another location. All proceeds that the City receives from any sale of Public Open Space lands shall be used to acquire additional open space lands elsewhere. (3.5-I12 - split)

**5-3**

Comment: Same comment as above, impacts to habitat shall be mitigated at the prescribed ratios and defined locations found in Section 6 of the HCP. The Water Agency shall hold all conservation easements for projects approved under the HCP.

Page-LU-29  
Policy-LU-P5.2

Lands East of Leisure Town Road: In conjunction with approval of any new urban development on lands shown as "Area B" on Figure LU-3, which consists of lands that are inside the Urban Growth Boundary but east of Leisure Town Road and between the Locke Paddon Community areas on the north and New Alamo Creek on the south, the City shall require such development to mitigate its impact on agricultural and open space lands by preserving, to the extent consistent with applicable law, for each acre of land developed, at least 1 acre of land outside the Urban Growth Boundary but within Pleasants Valley, Upper Lagoon Valley, or Vaca Valley, or any other location that is within 1 mile of the Urban Growth Boundary. Alternatively, to the extent consistent with applicable law, such development may pay an equivalent in-lieu fee as determined by the City in consultation with the Solano Land Trust. Lands acquired directly or with fees collected pursuant to this requirement shall first be offered to the Solano Land Trust. Any such fees transferred to the Solano Land Trust may only be used to acquire or protect lands outside of the Urban Growth Boundary but within 1 mile of the Urban Growth Boundary, or within Pleasants Valley, Upper Lagoon Valley, or Vaca Valley. Acquisitions pursuant to this requirement shall be coordinated with the Solano Land Trust. (2.10-G2)

**5-4**

Comment: Same comment as above, impacts to habitat shall be mitigated at the prescribed ratios and defined locations found in Section 6 of the HCP. The Water Agency

shall hold all conservation easements for projects approved under the HCP.

5-4  
cont.

LU-30  
Policy-LU-P5.3

Coordination with Future Solano County LAFCO Open Space or Agricultural Land Mitigation Program: If the Solano County Local Agency Formation Commission (LAFCO) adopts an open space or agricultural land mitigation program applicable to the area defined in Policy LU-P5.2, lands defined therein shall be subject only to the requirements of the LAFCO mitigation program, provided that if the requirement described in Policy LU-P5.2 provides greater mitigation than the LAFCO requirement, the incremental difference between the two programs shall be imposed in addition to the LAFCO requirement to the maximum extent permitted by State law. To the extent the LAFCO requirement and this requirement overlap, development shall be subject to only the LAFCO requirement. (2.10-G3)

5-5

Comment: As described above, once the HCP is adopted, all lands within Vacaville's sphere of influence are subject to the conservation and mitigation measures in the HCP.

LU-34  
Goal LU-8

Coordinate with surrounding jurisdictions and other local and regional agencies that may affect Vacaville's future development patterns and character.

5-6

Comment: Vacaville will need to adopt an ordinance (policy) to adopt, abide by, and implement the HCP in coordination with the Solano County Water Agency.

Section 4-Conservation and Open Space Element  
COS-6-8

Table COS-2 does not accurately reflect the Covered and Special Management Species in the HCP. Specifically, the following species are included in the HCP but are not listed on Table COS-2:

Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*)  
Soft Bird's-beak (*Cordylanthus mollis* ssp. *mollis*)  
Mason's lilaopsis (*Lilaeopsis masonii*)  
California Black Rail (*Laterallus jamaicensis coturniculus*)  
California Clapper Rail (*Rallus longirostris obsoletus*)  
Suisun Song Sparrow (*Melospiza melodia maxillaris*)  
California red-kegged frog (*Rana aurora draytonii*)

5-7

Giant garter snake (*Thamnophis gigas*)  
Salt Marsh harvest mouse (*Reithrodonomys raviventris haliocoetes*)  
Callippe silverspot butterfly (*Speyeria callippe callipe*)  
Steelhead California Central Valley ESU (*Oncorhynchus mykiss*)  
Delta smelt (*Hypomesus transpacificus*)  
Sacramento splittail (*Pogonichthys macrolepidotus*)  
Longfin smelt (*Spirinchus thaleichthys*)  
Green sturgeon (*Acipenser medirostris*)  
Hogwallow starfish (*Hesperovax caulescens*)  
Rose-mallow (*Hibiscus lasiocarpus*)  
Ferris' goldfields (*Lasthenia ferrisiae*)  
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)  
Delta mudwort (*Limosella subulata*)  
Suisun marsh aster (*Symphotrichum lentum*)  
Saline clover (*Trifolium depauperatum* var. *hydrophilum*)  
Valley Needlegrass Grassland  
San Francisco Common Yellowthroat (*Geothlypis trichas sinuosa*)  
Suisun shrew (*Sorex ornatus sinuosus*)  
Samuels Song Sparrow (*Melospiza melodia samuelis*)  
Yellow-headed blackbird (*Xanthcephalus zanthcephalus*)

5-7  
cont.

The following species on Table COS-2 are not in the HCP:

Big-scale balsamroot (*Basamorhiza macrolepsis* var. *macrolepsis*)  
Big tarplant (*Blepharizonia plumose*)  
Holly-leaved ceanothus (*Ceanothus purpureus*)  
Mt. Diablo buckwheat (*Erigonum truncatum*)  
Adobe-lily (*Fritillaria pluriflora*)  
Brewer's western flax (*Hesperolinon breweri*)  
Northern California black walnut (*Juglans hindsii*)  
Rayless ragwort (*Senecio aphanactis*)  
Slender-leaved pondweed (*Stuckenia filiformis*)  
Showy Indian clover (*Trifolium amoenum*)  
Wilbur Springs shore bug (*Saldula usingeri*)  
American Peregrine Falcon (*Falco peregrinus anatum*)  
White-tailed Kite (*Elanus leucurus*)  
Pallid bat (*Antrozous pallidus*)  
Townsend's big-eared bat (*Corynorhinus townsendii*)  
Greater western mastiff-bat (*Eumops perotis californicus*)  
Western red bat (*Lasiurus blossevilli*)

5-8

COS-10  
Policy COS-P1.10

Where avoidance of wetlands is not practicable or does not contribute to long-term conservation of the resources, require new development to provide for off-site mitigation that results in no net loss of wetland acreage and functional value within the watersheds draining to the Delta. (8.2-16 - split)

Comment: As described above, once the HCP is adopted, all lands within Vacaville's sphere of influence are subject to the conservation and mitigation measures in the HCP.

5-9

COS-10  
Policy COS-P1.12

Until the Solano Habitat Conservation Plan (HCP) is adopted, comply with all of the Avoidance and Minimization Measures listed in the Draft Solano HCP. In addition, require that development projects provide copies of required permits, or verifiable statements that permits are not required, from the California Department of Fish and Game (2081 Individual Take Permit) and US Fish and Wildlife Service (Section 7 Take Authorization) prior to receiving grading permits or other approvals that would permit land disturbing activities and conversion of habitats or impacts to protected species.

Comment: The Water Agency applauds Vacaville's effort to comply with draft conservation measures of the HCP.

5-10

COS-10  
Action COS-A1.1

Adopt and implement the requirements of the Solano Habitat Conservation Plan (HCP) once it is approved. If the Solano HCP is not adopted, develop standardized policies for conserving natural communities affected by development.

Comment: This Action may resolve comments in this letter regarding compliance with the Solano HCP, however, there is no qualifying language stating that this Action supersedes the noted actions in this letter that might conflict with the HCP.

5-11

COS-12  
Action COS-A1.7

Amend the Land Use and Development Code to require that new development mitigate all impacted oak woodland and oak savanna habitats by preserving oak woodland and oak savanna habitat with similar tree canopy densities at a 3:1 ratio (preservation:

5-12

impact).

Comment: Same comment as above, impacts to habitat shall be mitigated at the prescribed ratios and defined locations found in Section 6 of the HCP. The Water Agency shall hold all conservation easements for projects approved under the HCP.

**5-12  
cont.**

COS-14  
Policy COS-P2.2

Protect existing stream channels and riparian vegetation by requiring buffering or landscaped setbacks and storm runoff interception. (8.1-15)

**5-13**

Comment: The HCP (Section 6.3.5) has specific avoidance, minimization, and setback requirements for stream channels and riparian areas that must be adhered to once the HCP is adopted.

COS-14  
Policy COS-P2.3

Require creekway and riparian area protection during construction, such as providing adequate setbacks from the creek bank and riparian areas, and creekway and riparian area restoration after construction. (8.1-14 and 8.2-11)

**5-14**

Comment: The HCP (Section 6.3.5) has specific avoidance, minimization, and setback requirements for stream channels and riparian areas that must be adhered to once the HCP is adopted.

COS-14  
Policy COS-P2.5

Encourage restoration and expansion of riparian and floodplain habitat within channelized streams and flood channels where feasible, such as old Alamo Creek and old Ulatis Creek channels east of Leisure Town Road.

**5-15**

Comment: We applaud this action, the HCP has identified specific areas for riparian and floodplain conservation and restoration (Section 4.3.6.3) and portions of Alamo and Ulatis Creeks are targeted for such actions in the HCP.

COS-15  
Action COS-A2.1

Develop a creek protection ordinance requiring development setbacks from creeks and

**5-16**

protection of the creeks and associated riparian habitats during construction, and restoration after construction. As part of this ordinance, implement programs to limit invasive non-native species from becoming established or expanding within the city, and evaluate public access along creekways to ensure protection of habitat resources and to ensure public safety within creek setback areas. Update the City's Creekways Policy to be consistent with the creek protection ordinance. (8.1-14)

5-16  
cont.

Comment: We applaud this action as well. As noted above, there are specific avoidance and minimization efforts in the HCP for stream and riparian zones.

Section 6

PUB-18  
Solano Project

5-17

Water Supply-Solano Project-Monitcello Dam was completed in 1957, Solano Project water deliveries commenced in 1959.

If you have any questions regarding these comments, please give me a call at 455-1105 or send me a note at [clee@scwa2.com](mailto:clee@scwa2.com).

5-18

Sincerely,



Chris Lee,  
Principal Water Resources Specialist



ESTABLISHED 1850

## CITY OF VACAVILLE

650 MERCHANT STREET  
VACAVILLE, CALIFORNIA 95688-6908  
www.cityofvacaville.com

STEVE HARDY  
Mayor

MITCH MASHBURN  
Vice Mayor

DILENNA HARRIS  
Councilmember

CURTIS HUNT  
Councilmember

RON ROWLETT  
Councilmember

December 17, 2013

I am writing this letter on behalf of the Vacaville REACH Youth Coalition, a group of about 30 youth who focus on community service projects and safety concerns in the community. They are working on improving a well worn path that grew out of necessity in the Markham Area of the city. The path is known as the "Ghetto Trail" but the youth have renamed it the Rocky Hill Trail.

Our Coalition has been invested in the improvement of the trail due to safety concerns. REACH discovered the Rocky Hill Trail in 2009 after conducting surveys on middle school students in the Vacaville Unified School District. The survey sought to find out what youth issues were present in Vacaville. One issue that stood out was bike trail safety. Youth specifically noted the Rocky Hill Trail as a dangerous path. They noted that while unsafe, the trail was necessary to get to jobs, schools, child care, local stores and as a short cut through the community since walking is the primary mode of transportation for many in that area. The trail provides a connection for the neighborhood and is a vital resource for area residents. However, due to the conditions of the trail and the fact that it is not a recognized bike trail it attracts crime and abusive activities.

For the past four (4) years, REACH has worked with the Fathers House, B&G Club and Primera Iglesia Bautista to conduct community clean ups of the Rocky Hill Trail. Additionally, these organizations and community members participate in an effort to make the trail safer for area residents. This summer, REACH held 3 clean up days where they surveyed individuals using the trail to ask about some of their concerns. Many individuals mentioned they felt unsafe and did not like the conditions of the trail.

REACH has focused on improving safety not only on the trail but also the neighborhood as a whole. REACH youth did this through outreach with the Boys and Girls (B&G) Club, local churches and community members. For example, REACH youth worked with the B&G Club to provide tenants in over 600 apartments in the area with magnets with local important phone numbers such as graffiti and gang hotlines in an effort to encourage community members to call the police when needed. Our primary goal in the area is to improve safety.

In January 2013, REACH released their video "The Rocky Hill Trail – On a Path of Transformation" (<http://www.youtube.com/watch?v=1S7UziKKWus>) and presented it to the Vacaville City Council. Youth spoke about the quality of life and safety issues on the trail and neighborhood. They brought awareness to the trail and have since met with county and city officials and city staff from departments such as Police, Engineering, Housing and Public Works to develop solutions for the Rocky Hill Trail. The Housing Department owns the South side area of the trail that people are now using to get to Markham Ave. The Housing Department discussed that as part of future development for the Lincoln Corner Apartments they may include a park area for residents that incorporates part of the trail. REACH is also working to get Solano County on board since part of the property belongs to them. We have met with Solano County Board member John Vasquez and he is supportive of having a trail through their property and partnering with the City.

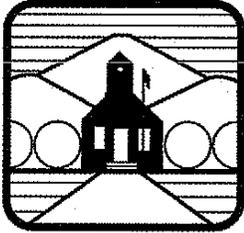
We are asking for the City to include the Rocky Hill Trail in the proposed General Plan. Having the trail as part of the General Part will allow us to make future improvements possible. These improvements will make the trail safer for families using it out of necessity. It will also give law enforcement greater accessibility to the trail

in emergencies. The REACH Coalition along with many of our partners are heavily invested in making the trail and neighborhood safer. Having the trail on the General Plan will get us one step closer to that goal.

**6-1  
cont.**

Respectfully submitted,

Judith Franco  
Program Coordinator  
Vacaville REACH Youth Coalition



**Vacaville Unified School District**  
**Educational Services Center**  
401 Nut Tree Road, Vacaville, California 95687-3508



Board of Education

David McCallum, President • Jerry Eaton, Vice President  
Sherie Mahlberg, Clerk • Shelley Dally  
Chris Flask • Michael Kitzes • Whit Whitman  
Ken Jacopetti, Board Secretary & Superintendent

December 17, 2013

Ms. Tyra Hays  
General Plan Update Project Manager  
City of Vacaville Community Development Department  
650 Merchant Street  
Vacaville, CA 95688  
[GPUupdate@cityofvacaville.com](mailto:GPUupdate@cityofvacaville.com)

**Subject: General Plan Update and Draft EIR.**

Dear Ms. Hayes:

Vacaville Unified School District (“School District”) is pleased to provide the City with comments to the General Plan Update and associated Draft Environmental Impact Report.

7-1

**A. School District Properties.**

First, the District would like to compliment the City Staff for its efforts in proposing a “Residential Low Density (3.1-5 units/acre)” General Plan Designation for the 4.2-acre Jepson Middle School surplus property and for the “Residential Estate (0.5-3 units/acre)” designation for the 8.01-acre western remainder surplus parcel of the Rice-Murtry/Browns Valley Elementary School No. 2 site.

7-2

Second, the former District Office Site, 751 School Street, 2.03 acres gross (APN 0130-112-060) has been declared surplus by the School District. Its current General Plan Designation is “Public Park”<sup>1</sup>, with a zoning Overlay District of “Residential Urban High Density”. The proposed General Plan Designation is “Public/Institutional (0.3 max FAR)”. The School District continues to request a mixed-use or appropriate residential designation for this property.

7-3

The former District Office Site remains the best downtown location available for residential development or mixed-use commercial-residential development. It is located adjacent to Andrews Community Park and close to the riparian way with its mature trees and downtown commercial uses. It also opens up onto the commercial land uses of Monte Vista Avenue.

<sup>1</sup> The current designation is apparently due to a mapping error. The designation for the then-operating District Office property should have been “Public/Institutional”.

**B. East of Leisure Town Road and Northeast New Growth Areas**

The District appreciates the efforts that City staffmembers have taken to work with us and the landowners/developers in the ELT and Northeast New Growth Areas. Because of these efforts, there are currently three school sites designated on the land use map.

The Draft EIR states that the new growth area east of Leisure Town Road is likely to provide 4,682 new homes at full build-out. It is anticipated that this new development will generate 1,387 new K-6 students; 544 new 7<sup>th</sup>-8<sup>th</sup> grade middle school students and 792 new 9<sup>th</sup>-12<sup>th</sup> grade high school students, for a total of 2,724 new K-12 students. As we have documented in previous letters and responses throughout the General Plan process, these new students will generate a need for 1-2 new elementary or K-8 schools, plus additions and/or improvements at existing middle and high schools.

Because the cost of new schools for this area is not adequately funded by the current level of the state's and the District's statutory mitigation fees, the District will seek full mitigation from the developers in order to construct the schools. The School District looks forward to working with developers and the City to achieve this mitigation so students will be able to attend neighborhood schools.

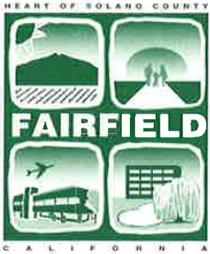
As has been stated by the School District in a number of General Plan Update community meetings, the District can make no commitment to opening new schools where the impact has not been fully mitigated by local funding sources. Of course, in developing any new schools in the East of Leisure Town area, the School District looks forward to working with the City on traffic, sidewalk, and infrastructure issues.

Sincerely,



Mr. Ken Jacopetti, Superintendent

cc: Members, Board of Education, Vacaville Unified School District  
Kari Sousa, Associate Superintendent, VUSD  
Leigh Coop, Director of Facilities, VUSD



CITY OF FAIRFIELD

COMMUNITY DEVELOPMENT DEPARTMENT
Planning Division

Incorporated December 12, 1903

COUNCIL

- Mayor: Harry T. Price
Vice-Mayor: Rick Vaccaro
Councilmembers: Pam Berlani, Catherine Moy, John Mraz

December 18, 2013

COPY VIA ELECTRONIC EMAIL; ORIGINAL TO FOLLOW IN US MAIL

Tyra Hays, Project Manager
City of Vacaville, Community Development Department
650 Merchant Street
Vacaville, CA 95688

Re: General Plan Draft Environmental Impact Report

Dear Ms. Hays:

The City of Fairfield has reviewed the Draft EIR for the City of Vacaville General Plan. Thank you for the opportunity to review and comment upon this project.

8-1

The City of Fairfield notes that some of the impacts identified in the EIR, along with associated mitigation measures, affect intersections within the City of Fairfield. Some impacts are inevitable as Fairfield and Vacaville are neighboring communities experiencing significant growth, with additional growth planned for the future. At the same time, the two communities have historically acknowledged growth impacts and have worked together to mitigate such impacts.

The Vacaville General Plan Draft EIR identifies four key intersections and interchanges which will be impacted by development in the new General Plan. As acknowledged by the Draft EIR, the City of Vacaville has no control over these intersections and interchanges and it would be challenging for the City of Vacaville to implement intersection improvements under the jurisdiction of Fairfield or the State (CALTRANS). For reference, the specific Traffic Mitigation Measures at issue are TRAF 31-34, which address the following intersections:

8-2

- Air Base Parkway and Interstate 80
North Texas Street and Interstate 80
Peabody Road and Air Base Parkway
Peabody Road and Jepsen Parkway (Cement Hill Road/Vanden Road)

The Draft EIR includes mitigation measures which may require reconfiguration of and expansion at existing intersections and interchanges, including intersections within the Train Station Specific Plan Area. As you know, the City is currently

8-3

Tyra Hays, Project Manager  
City of Vacaville, Community Development Department  
Re: General Plan Draft Environmental Impact Report  
December 18, 2013  
Page 2

designing roadway improvements along Peabody Road, and there may be engineering constraints at these and the other locations identified in the Draft EIR.

8-3  
cont.

The City of Fairfield is certainly willing to work with the City of Vacaville to fund and implement feasible improvements within the City of Fairfield needed to address local and regional traffic congestion. Jepson Parkway and Peabody Road are Routes of Regional Significance, and the City of Fairfield and the City of Vacaville will need to continue to work together to monitor traffic flow and congestion as detailed planning for development is completed.

8-4

However, because mitigating the impacts at these locations requires improvements outside Vacaville's jurisdiction, the EIR should conclude that the specific impacts are "significant and unavoidable".

We would be happy to meet to discuss these comments.

Sincerely,



ERIN L. BEAVERS  
Director of Community Development

ELB:BKM:ccs

- c: David Feinstein, City of Fairfield, Community Development Department
- Brian Miller, City of Fairfield, Community Development Department
- George Hicks, City of Fairfield, Public Works Department
- Garland Wong, City of Fairfield, Public Works Department

# COMMENT LETTER # 9

DIRECTORS  
ROBERT HANSEN  
PRESIDENT - DIV. #5  
  
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DISTRICT ENGINEER  
  
MINASIAN, SPRUANCE, MEITH,  
SOARES & SEXTON, LLP  
ATTORNEYS

December 18, 2013

Maureen Traut Carson  
Director of Community Development  
City of Vacaville  
650 Merchant Street  
Vacaville, CA 95688

**RE: General Plan Draft Environmental Impact Report**

Dear Ms. Carson,

Thank you for the opportunity to provide final comments on the City of Vacaville's General Plan Draft Environmental Impact Report (EIR). The Solano Irrigation District (SID) appreciates having had the opportunity to work with the City of Vacaville (City) over the past number of months to come to a better understanding of the City's updated General Plan and its impacts on SID and agricultural lands within SID.

9-1

As you know, the updated General Plan does cause impacts to the Master Water Agreement (MWA) last amended on June 15, 2010 between SID and the City. Although the City and SID have many mutual goals (more specifically identified in the MWA) when it comes to the preservation of farmland, urbanization and to the allocation of our joint water resources, to date the MWA has not been amended to address those impacts. SID does look forward to finalizing its negotiations with the City regarding the MWA before the City adopts a Final EIR (the goal will be to ensure the City addresses all potential environmental impacts). As such, SID is not relinquishing its rights under the June 15, 2010 Amendment of the MWA.

9-2

In addition, the EIR needs to address the impacts to existing District facilities used to convey irrigation and drainage water to/from SID customers. Those facilities need to be protected and/or relocated such that the District can continue to efficiently serve its customers without impact to current or future operations and costs to replace or maintain those facilities.

9-3

In summary, SID supports the City in achieving its long-term planning goals. The City's proposed General Plan, however, is inconsistent with the MWA and the MWA needs to be updated before the City issues its Final EIR. Although the City and SID have had positive work towards an update, it remains incomplete. Therefore, SID looks forward to finalizing these negotiations as soon as possible.

9-4

Sincerely,



Cary Keaten  
Solano Irrigation District General Manager

cc: Paul Minasian, Solano Irrigation District General Counsel



Department of
Resource Management
675 Texas St., Ste. 5500
Fairfield, California 94533

Planning Services Division
Phone: (707) 784-6765 / Fax: (707) 784-4805

Mike Yankovich
Planning Program Manager

December 18, 2013

Tyra Hays, Senior Planner
City of Vacaville Community Development Department
650 Merchant Street,
Vacaville, CA 95688

Re: City of Vacaville General Plan Update and DEIR

Tyra,

The Department would like to submit the following comments relative to the city's General Plan Update, Energy Conservation Action Strategy, and DEIR.

10-1

- 1. Policy COS-P4.1 proposes a 500 foot agricultural buffer between new development and existing agricultural lands in the East of Leisure Town Growth Area. 115' of this buffer is to be located within the City's Urban Growth Boundary and 385' is to be located outside the UGB, within the unincorporated area of Solano County. The Policy states that the area outside the UGB is limited in land use to public infrastructure improvements necessary to accommodate build-out of the Vacaville General Plan.

County Comments:

The County's General Plan includes Policy AG.P-16, which reads:

"Minimize potential conflicts between agricultural and residential uses by encouraging the use of urban-agricultural buffers within city municipal service areas between residential uses and agricultural lands".

Implementation Program AG.I-5 further reads:

"Work with cities to establish appropriate urban-agricultural buffers where new residential uses within municipal service areas may conflict with agricultural uses. Urban-agricultural buffers shall be an appropriate size to meet desired objectives, but in no case less than 300 feet in width. The buffer should occur on developing parcels located within municipal service areas to the extent feasible; be managed by the landowner, developer, homeowners association, or a special purpose district; and favor protection of the maximum amount of farmable land".

10-2

The County General Plan encourages the location of the buffer to be within the MSA to the extent feasible. The City's requirement for 385' of the buffer to be located outside the UGB will require that land to be permanently taken out of agricultural use to accommodate the buffer. It also removes the City from any jurisdictional control of this portion of the buffer.

Further, for the 385' of buffer outside the UGB, the County General Plan designation is Agriculture and the zoning designation is Exclusive Agriculture. County zoning regulations and permitting would apply. County regulations primarily encourage agricultural related uses. To the extent that infrastructure uses are proposed, they may be permitted, conditionally permitted, or outright prohibited. The uses referenced in the City's draft policy are solely intended to accommodate the development area within the City and should be located within the City's permitting jurisdiction, not in the County.

The County believes that the buffer should be located entirely within the City's UGB in order for this policy (and the associated draft Land Use Map) to be consistent with the County's General Plan.

2. Action COS-A4.1 requires the adoption of an Agricultural Buffer Policy and zoning district.

County Comments

Because 385' of the buffer is intended to be located outside the UGB and within the County's jurisdictional boundary, the City does not have any zoning authority in this area. County zoning regulations and General Plan policies will apply. Since this area will still be designated Agriculture in the General Plan and Exclusive Agriculture in the zoning ordinance, placing easements or deed restrictions over this area with the intent of eliminating agricultural uses would seem in direct conflict with the County General Plan and zoning ordinance. As stated above, any infrastructure needed to accommodate the City's proposed growth in this area should be located within the City's UGB.

10-3

3. Permanent Agriculture Overlay area.

County Comments

First off, this area should be remapped to remove the Elmira area and the city's treatment ponds from this overlay. Elmira is predominantly a residential area with no agricultural land uses existing or proposed. Secondly, while we understand that that the primary intent of this area is for mitigation of city development, we'd like to stress that the city has no land use or permitting authority in this area. It falls within the jurisdiction of Solano County. So while the city may like to see it as permanent agriculture, all land uses listed in the County's zoning ordinance are potential uses that could locate in this area subject to the permitting procedures of Solano County. As such, it seems that referencing this area as an "overlay" on the map is awkward as an overlay presumes some sort of authority. It would seem that discussing this area as a priority area for mitigation purposes within the textual context of the Plan would be more appropriate.

10-4

4. Transportation and Circulation Element

County Comments:

Under the General Plan's Transportation Element, Goal TR-4 is to mitigate traffic impacts from new development. There are three major impacts to the existing transportation system: Level of Service (LOS), geometric standards, and life cycle.

10-5

LOS and geometric standards are covered within the city limits, but impacts to adjacent unincorporated roads are not. Peabody Road is identified as a rural arterial which receives a high volume of traffic; however, the LOS for the section between Vacaville and Fairfield city limits is not covered adequately. This segment of road becomes heavily impacted during peak hours. The LOS of this short segment is not studied nor addressed, while additional traffic will further reduce the LOS and thus create an impact.

The second aspect to traffic impacts from new development is life cycle. These impacts are not addressed in the General Plan and stand to be significant for adjacent unincorporated roads. The City development that is planned will result in increased usage of the unincorporated routes of regional significance. The increased traffic will produce higher maintenance costs with resulting shorter life spans of the road surfaces. These impacts need to be addressed.

10-6

The County Transportation Impact Fee (TIF) identifies the impacts of new development on county roads and identifies improvements needed to bring many of the identified roads on Figure TR-1 up to an appropriate geometric standard. The TIF does not cover all the costs associated with bringing the roads up to appropriate geometric standards, nor does it cover the impacts from increased axle loadings and resulting reduced life cycles. These impacts need to be addressed.

10-7

5. Draft Energy and Conservation Action Strategy (ECAS)

County Comments:

The County would like to see a reference to, or a discussion of a Community Choice Aggregation (CCA) program in the City's proposed Energy and Conservation Action Strategy. In the County's adopted Climate Action Plan, the potential benefits and costs of a CCA are discussed and an estimated reduction in GHGs is provided if the County were ever to participate in a CCA. The potential GHG emissions reduction is substantial and worthy of disclosure to the public and decision makers. Though the County has not yet looked at the feasibility of such a program, it would likely need to include many, if not all, of the cities in Solano County to participate. It would seem that providing a discussion of the potential benefits (in terms of reduction of GHG emissions) of a CCA program in the ECAS would provide both the public and decision makers with valuable information.

10-8

Thank you for considering these comments. Questions relating to #s 1, 2, 3, and 5 can be directed to Matt Walsh at 784-6765. Questions relating to #4 above should be directed to Matt Tuggle at the same number.

10-9

Sincerely,

*Matt Walsh*

*for*

Mike Yankovich  
Planning Program Manager

Author: RMacalaly Subject: Sticky Note  
17:00, Plan Bay Area, was approved by MTC on July 18, 2013. PBA serves as the first Sustainable Communities Strategy (SCS) for the Bay Area, a required by SB 375. Date: 12/12/2013 2:35:25 PM

Author: RMacalaly Subject: Sticky Note  
Update to include PBA projects, and list the 10 performance criteria included in PBA. Date: 12/12/2013 2:36:19 PM

11-1  
11-2

implementations are to be determined based on consultation between Caltrans, the City of Vacaville, and the project proponent.

b. Complete Streets Act of 2008

The California Complete Streets Act (Assembly Bill 1358) requires cities and counties, when updating their general plans, to ensure that local streets meet the needs of all users.

c. California Transportation Commission

The California Transportation Commission (CTC) consists of nine members appointed by the Governor. The CTC is responsible for the programming and allocation of funds for the construction of highway, passenger rail, and transit improvements throughout the State, including in the Vacaville study area. The CTC is also responsible for managing the State Transportation Improvement Program (STIP) and the State Highway Operator and Protection Program (SHOPP) funding programs.

**3. Regional Agencies, Plans, and Policies**

This section summarizes regional agencies, plans, and policies that pertain to transportation in Vacaville.

a. Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating, and financing agency for the nine counties in the Bay Area, including Solano County. It also functions as the federally mandated metropolitan planning organization (MPO) for the region. MTC authored the current regional transportation plan known as *Transportation 2035* that was adopted on April 22, 2008. *Transportation 2035* specifies a detailed set of investments and strategies throughout the region from 2010 through 2035 to maintain, manage, and improve the surface transportation system, specifying how anticipated federal, State, and local transportation funds will be spent. The projects included in the 2035 Plan that will most directly affect the proposed Vacaville General Plan are:

- ◆ Construction of a new Fairfield/Vacaville Multi-Modal Train Station at the southeast corner of Peabody Road and Vanden Road in northeast Fairfield for the Capitol Corridor intercity rail service.
- ◆ Construction of a ten-bay bus carousel and a 220-space parking lot (Phase 1) and a 400-space parking garage (Phase 2) at the Vacaville Intermodal Station. (Status: Phase 1 of this project has been completed. A feasibility study is currently in progress for Phase 2.)
- ◆ Construction of Jepson Parkway from Route 12 to Interstate 80 at the Leisure Town Road Interchange. In Vacaville, Jepson Parkway will follow the Leisure Town Road alignment.

Author: RMacaulay, Subject: Sticky Note Date: 12/12/2013 2:39:53 PM  
Complete Streets requires consideration of the accumulation of all forms of travel, including bikes, ped, ADA, transit and goods movement, and is sensitive to the context of the roadway, (i.e. no need top full sidewalks in rural areas).

11-3

Author: RMacaulay, Subject: Sticky Note Date: 12/12/2013 4:13:14 PM  
ABAG no longer prepares Projections. It does prepare the existing conditions and land use scenarios for the SCS, as required by SB 375.

11-4

- ◆ Widening of Interstate 80 to add an express lane in each direction from the Fairfield city limits to Alamo Drive in Vacaville, is in design)
- ◆ Widening of Interstate 80 to add an express lane in each direction from the Yolo County line to State Route 37.

MTIC has established its policy on Complete Streets in the Bay Area. The policy states that projects funded all or in part, with regional funds (e.g. Federal, State Transportation Improvement Program, bridge tolls) must consider the accommodation of bicycle and pedestrian facilities, as described in Caltrans Deputy Directive 601. These recommendations do not replace locally adopted policies regarding transportation planning, design, and construction. Instead, these recommendations facilitate the accommodation of pedestrians, including wheelchair users, and bicyclists into all projects where bicycle and pedestrian travel is consistent with current adopted regional and local plans. Transportation projects that use regional funds in the Vacaville study area are subject to this policy.

To qualify for the current round of MTC's One Bay Area Grant (OBAG) program, jurisdictions had to adopt a Complete Street Resolution or adopt a General Plan that complies with the California Complete Streets Act of 2008 by January 31, 2013. The City of Vacaville adopted Complete Streets Resolution 2012-125 on December 11, 2012. In addition, the proposed Transportation Element is consistent with the Complete Streets Act.

b. Association of Bay Area Governments

The Association of Bay Area Governments (ABAG) is the regional planning agency for the nine counties of the Bay Area, including Solano County. It primarily deals with land use, housing, environmental quality, and economic development issues, which are often closely connected to transportation. ABAG prepares forecasts of employment and population (*ABAG Projections*) approximately every two years. The ABAG Projections serve as the basis for regional travel forecasts and transportation programming.

c. Solano Transportation Authority

The Solano Transportation Authority (STA) has been designated as the Congestion Management Agency to address congestion issues in Solano County and the seven cities within the county, including Vacaville. It is responsible for countywide transportation planning, programing transportation funds, managing and providing transportation programs and services, delivering transportation projects, and setting transportation priorities. The STA Board of Directors adopted the Solano County Comprehensive Transportation Plan (CTP 2030)<sup>3</sup> in June 2005. The Plan envisions, directs, and prioritizes the transportation needs of Solano County through 2030.

<sup>3</sup> Solano Transportation Authority, *Solano Comprehensive Transportation Plan*, adopted June 8<sup>th</sup> 2005.

The Plan identifies a list of Routes of Regional significance, which are roadways that carry significant through-traffic, connect two or more jurisdictions, serve major transportation hubs, or cross county lines. Since these routes are significant to the transportation network of the region, and serve more than local transportation needs, they are eligible for federal funding. The CTP is being updated. The new plan, 2009 CTP 2035 Update, will cover the 2009-2035 time period.

In addition to the CTP, STA has prepared other planning documents such as the Solano Countywide Bicycle Transportation Plan,<sup>4</sup> Solano Countywide Pedestrian Plan,<sup>5</sup> and the Vacaville Community-Based Transportation Plan<sup>6</sup> that also envisions a transportation network to serve the needs of all roadway users.

As the designated Congestion Management Agency, STA works with jurisdictions within the county, including Vacaville, to identify locations where periodic congestion monitoring would occur as required by the State's congestion management program (CMP) legislation. The major goals of the CMP are to maintain mobility on Solano County's streets and highways and to ensure the County's transportation system operates effectively as part of the larger Bay Area and northern California transportation systems. State law requires that level of service standards be established as part of the CMP process. The purpose of setting level of service standards for the CMP system is to provide a quantitative tool to analyze the effects of land use changes and to the system's performance (i.e. congestion). CMP roadways are subject to biannual monitoring. If the actual system performance falls below the standard (i.e., congestion worsens to LOS B) actions must be taken to improve the level of service.

STA also maintains a Solano/Napa Travel Demand Model to evaluate and project future traffic growth in the region. Traffic volume forecasts from the Solano/Napa Model are used to analyze regional transportation projects. The Solano/Napa Model maintains consistency with the population, housing, and employment projection developed by ABAG.

The Land Use Impact Analysis of the CMP specifies that general plan amendments must be evaluated using the Solano/Napa Travel Demand Model.

#### d. Air Quality Districts

There are two air quality districts that address air pollution in the Vacaville study area. Since a primary source of air pollution in the Vacaville region is from motor vehicles, the district regulations affect transportation planning in the study area. The Yolo-Solano Air Quality Management District (YSAQMD), established by a joint powers agreement between Yolo and Solano Coun-

Author: RMacaulay Subject Highlight Date: 12/12/2013 4:39:52 PM

Author: RMacaulay Subject Sticky Note Date: 12/12/2013 4:40:30 PM

Author: RMacaulay Subject Sticky Note Date: 12/12/2013 4:51:26 PM

Author: RMacaulay Subject Sticky Note Date: 12/12/2013 4:51:26 PM

11-5  
11-6

<sup>4</sup> Solano Transportation Authority, *Solano Countywide Bicycle Transportation Plan*, adopted December 14, 2011.

<sup>5</sup> Solano Transportation Authority, *Solano Countywide Pedestrian Plan*, adopted January 11, 2012.

<sup>6</sup> Solano Transportation Authority, 2010, *Vacaville Community-Based Transportation Plan*.

 Author: Rikatealuy Subject: Sticky Note Date: 12/19/2013 7:55:32 AM  
STA is concerned about the installation of an additional traffic signal on the Jepson Parkway. This is an area where the traffic signals are already dense, and additional signals could reduce the throughput of the Jepson Parkway.

ly mitigating the project impacts. However, because this location is not under Vacaville's jurisdiction, the City is not able to assure the timing, right-of-way and funding availability for the implementation of the improvements. Therefore, the project impacts are *significant and unavoidable*.

**Impact TRAF-22:** The unsignalized Cherry Glen Road at Interstate 80 Westbound Ramp intersection (20) would degrade to LOS E in the AM peak hour and LOS F in the PM peak hour. This location is a freeway ramp intersection and is under Caltrans jurisdiction.

**Mitigation Measure TRAF-22:** The City of Vacaville, in coordination with Caltrans, shall implement the following measure:

- ◆ Install stop signs on the northbound and southbound approaches to provide all-way stop control at the intersection.

**Significance After Mitigation:** Implementation of the stated mitigation measure would improve the intersection operations to LOS B with average delays of 13.7 seconds in the AM peak hour and LOS C with average delays of 16.7 seconds in the PM peak hour, thereby fully mitigating the project impacts. However, because this location is not under Vacaville's jurisdiction, the City is not able to assure the timing for the implementation of the improvements. Therefore, the project impacts are *significant and unavoidable*.

**Impact TRAF-23:** The unsignalized Leisure Town Road at Gilley Way intersection (34) would degrade to LOS F on the work minor street approach during both peak hours, while the overall intersection would deteriorate to LOS F in the PM peak hour.

**Mitigation Measure TRAF-23:** The City of Vacaville shall implement the following measure:

- ◆ Install  traffic signal at the intersection as the peak hour traffic signal warrant would be met.

**Significance After Mitigation:** Installation of a traffic signal would provide LOS mid-D or better operations with average delays of 40.6 seconds in the AM peak hour and 35.3 seconds in the PM peak hour. However, a traffic signal at this location would be in conflict with the adopted Jepson Parkway Concept Plan. Alternative mitigation measures will need to be evaluated at this location, such as closing the median, or "worm islands" that restrict left turns. Because implementation of a traffic signal implementation would be in conflict with other plans and policies, and because it is unknown if alternative mitigation measures would improve the level of service to within acceptable thresholds, the impact is *significant and unavoidable*.

**Impact TRAF-24:** The Leisure Town Road at Marshall Road intersection (37) would degrade to LOS F during both peak hours.

Mitigation Measure TRAF-24: ~~The City of Vacaville shall implement the following measure:~~

- ◆ ~~Install a  left-turn signal at the intersection as the peak hour traffic signal warrant would be met.~~

Significance After Mitigation: Implementation of this improvement would provide LOS C with average delays of 25.7 seconds and 30.0 seconds in the AM and PM peak hours, respectively, and the impact would be *less than significant*.

**Impact TRAF-25:** The unsignalized Leisure Town Road at North-South Arterial intersection (43) would degrade to LOS E with an average delay of 49 seconds on the worst minor street approach during the PM peak hour, while the overall intersection would operate at LOS A.

Mitigation Measure TRAF-25: The City of Vacaville shall implement the following measure:

- ◆ Provide a storage pocket on the south leg to allow a two-stage, eastbound, left-turning movement.

Significance After Mitigation: Implementation of this improvement would provide LOS C operations with an average delay of 19 seconds on the worst minor street approach and the impact would be *less than significant*.

**Impact TRAF-26:** The unsignalized Midway Road at I-505 Northbound Ramp intersection (52) would degrade to LOS F on the worst minor street approach during both peak hours, while the overall intersection would operate at LOS A in the AM peak hour and LOS F in the PM peak hour. This location is a freeway ramp intersection and is under Caltrans jurisdiction.

Mitigation Measure TRAF-26: The City of Vacaville, in coordination with Caltrans, shall implement the following measures:

- ◆ Install a traffic signal at the intersection as the peak hour traffic signal warrant would be met.
- ◆ Eastbound approach: Convert the eastbound through-left shared lane to a through lane, and add a left-turn lane to provide a left-turn lane and a through lane.

Significance After Mitigation: Implementation of the stated mitigation measures would improve the intersection operations to LOS C with an average delay of 20.3 seconds, thereby fully mitigating the project impacts. However, because this location is not under Vacaville's



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December 18, 2013

Tyra Hays, Project Manager  
City of Vacaville, Community Development Department  
650 Merchant St.  
Vacaville, CA 95688

**Re: City of Vacaville General Plan and Energy and Conservation Strategy Draft Environmental Impact Report**

Dear Ms. Hays,

Thank you for the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the City of Vacaville’s General Plan and Energy and Conservation Strategy.

By way of introduction, Greenbelt Alliance is a non-profit public benefit environmental organization with over 4,000 active members in the San Francisco Bay Area. Our purpose is to make the Bay Area a better place to live by protecting and preserving open space within the nine-county Bay Area region and creating walkable, transit-oriented communities in the region through public policy development, advocacy, and education.

12-1

Our staff, board, and members have worked for more than fifty years to protect and enhance the quality of life in the Bay Area. We have participated in numerous land use issues in and adjacent to the City of Vacaville, including collecting more than 10,000 signatures in support of the current Urban Growth Boundary (UGB) and drafting smart land use and growth management policies for the city. We therefore have a direct and substantial organizational interest in the scope and quality of the environmental impact analysis of the project and its resultant impacts on the surrounding environment and communities.

**Overview**

The City of Vacaville (City) is considering the adoption of a comprehensive general plan update, covering development through 2035. The proposed General Plan (Plan) calls for extensive development of open space and agricultural lands, potentially outside the voter-approved UGB, and lacks any consideration for compact, infill development that could offset many of the anticipated significant and unavoidable impacts.

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If adopted, the General Plan would further exacerbate the region’s jobs-housing imbalance and result in increased greenhouse gas emissions, air pollution, and traffic impacts. In addition to the substantial loss of agricultural lands, the Plan would result in severe impacts on numerous sensitive biological communities, including vernal pools and wetlands, and the plant and wildlife species that rely on these habitats.

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Unfortunately, the DEIR for the Plan is thoroughly deficient and fails to comply with fundamental requirements of the California Environmental Quality Act (CEQA), including the proper analysis of the impacts of the proposed development pattern, project alternatives, and assessment of feasible mitigation measures. Of particular concern, it fails to analyze an infill development alternative, which could potentially show that the City’s growth could be accommodated by more compact development, thereby reducing the overall negative impacts on prime farmland and biological resources, while simultaneously creating more livable communities.

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Because of these deficiencies, the DEIR fails to serve as a meaningful decision-making tool for the Vacaville City Council, Vacaville residents, and other decision makers and stakeholders. The DEIR should be thoroughly revised and recirculated to address these issues. Some of the most pressing failures of the DEIR are described below:

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**The DEIR is fundamentally inconsistent with CEQA law, which requires that the DEIR be recirculated after extensive revision and re-scoping**

Greenbelt Alliance is deeply concerned about the DEIR’s failure to provide adequate analysis of development impacts from the proposed General Plan. A DEIR must provide extensive analysis of the full breadth of issues required by CEQA, determine the significance of those impacts, and detail achievable mitigations to reduce the negative consequences of the impacts from development.

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The failure of the DEIR to provide an adequate description of the Project – one that accounts for the land uses and types of development actually permitted by the General Plan – undermines its analysis of environmental impacts as well as its discussion of potential mitigation measures. The DEIR also fundamentally fails to disclose, analyze, and propose mitigation for environmental impacts that it merely assumes will be less than significant. The many vague, voluntary, and unenforceable policies cited as mitigation measures in the DEIR fail to comply with CEQA, which requires enforceable, concrete commitments to mitigation. As a result, the DEIR completely fails to describe measures that could avoid or substantially lessen the General Plan’s numerous significant impacts.

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CEQA requires recirculation of an EIR when significant new information is added to the document

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after notice and opportunity for public review was provided (CEQA § 21092.1; CEQA Guidelines § 15088.5). As will be shown in this comment letter, the requirements for a recirculated document are clearly met due to the extensive deficiencies in the DEIR. Greenbelt Alliance expects that the City will revise the DEIR based upon the issues identified here and those raised by others, and recirculate the DEIR after those revisions.

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cont.

**The DEIR fails to include enforceable mitigations throughout most of the document**

The DEIR identifies 30 areas of significant and unavoidable impacts. Despite the extensive development impacts, the DEIR provides entirely inadequate mitigation strategies, often lacking legally required analysis or suitable strategies to reduce the proposed significant effects of development.

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Worse, the DEIR often simply concludes that an impact is significant and unavoidable and moves on. A conclusion of residual significance does not excuse the lead agency from (1) performing a thorough evaluation and description of the impact and its severity before and after mitigation, and (2) proposing *all* feasible mitigation to “substantially lessen the significant environmental effect” (CEQA Guidelines § 15091(a)(1)). In particular, CEQA requires that the DEIR consider changes to land use designations or densities and intensities as potential mitigation. However, a thorough land use alternative analysis is entirely left out of the DEIR.

There is no indication that the DEIR considered modifications to land use designations or densities and intensities to mitigate the impacts of the General Plan. Yet those changes are the easiest, most effective, and most obvious ways to lessen or avoid many of the General Plan’s impacts. Compact, infill development around the urban core is widely shown to reduce vehicle trips, increase alternative modes of transportation, reduce infrastructure costs, and provide significant net environmental benefits. The proposed Plan instead proposes nearly all development in areas that would result in the loss of farmland of concern. Because this proposed development is far from Vacaville’s urban areas, it will result in increased travel, which in turn will result in increased criteria air pollutants and greenhouse gas emissions. Exploring alternative land use scenarios is essential to reduce numerous General Plan impacts, such as air quality, climate change, biological resources, agriculture, and traffic.

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A recirculated DEIR must show enforceable mitigation strategies, such as permit conditions, agreements, or other legally binding instruments, rather than vague and optional strategies that will do little to nothing to reduce negative impacts from development.

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**The DEIR fails to accurately calculate and analyze anticipated development**

CEQA law requires that Environmental Impact Reports, especially with local general plans,

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analyze the full extent of development. The City’s current DEIR not only provides a confusing and unlawful dual development alternative model (“*Full Buildout*” versus “*Horizon-Year Projection*”), but also provides little substantiation for the proposed development scenarios. The DEIR uses the Horizon-Year Projection to evaluate the impacts of development, which assumes a lower level of growth anticipated over the next 22 years, but these estimates are based on conjecture, rather than solid analysis of existing conditions. The Full Buildout alternative allows for two times more dwelling units and retail space and approximately nine times as much new commercial space and industrial space, as is assumed under the Horizon-Year Projection. Because the DEIR fails to assume development as allowed under the General Plan, it significantly underestimates the Project’s impacts.

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cont.

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CEQA requires that a municipality provide a robust investigation of existing conditions. The DEIR fails to provide adequate context for the two proposed alternatives, which undermines the document’s findings and strategies for mitigating the significant effects of the intensive sprawl development proposed. A recirculated DEIR must analyze the “Full Buildout” scenario in its entirety to provide a clear distinction from the other alternatives, as well as include a robust investigation of existing conditions.

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**The DEIR fails to provide the required analysis and mitigation strategies for impacts on prime farmland and open space**

Low-density residential and commercial developments have significant detrimental impacts on prime farmland and the sustainability of agricultural enterprise. In addition, farmers and ranchers struggle to remain economically viable due to speculative sprawl development. The California State Legislature has repeatedly asserted that preservation and protection of state farmland is an important policy goal and that CEQA is an important tool that should be used to carry out this goal.

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Despite the importance of agricultural resources to the City, County, and State, the DEIR fails to adequately describe the impacts to agricultural resources, and wholly fails to identify any mitigation measures to avoid or mitigate the loss of agricultural land. Accordingly, the DEIR’s discussion of agricultural resources, not only fails to effectuate an important public policy, but also fails to meet the basic requirements of CEQA.

The DEIR should propose mitigation measures to lessen development impacts on areas of prime farmland. Eleven percent (11%) of the land within the City limits is currently vacant (DEIR, section 4.10-10). Instead of focusing development in these vacant areas, the General Plan allows for, and the DEIR assumes that, the agricultural areas will be some of the first areas to be developed (DEIR, Figure 3-6). The DEIR must propose mitigation measures that would ensure that the vacant areas within the City limits are developed before areas with farmland of concern.

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In addition to considering land use alternatives that prioritize and phase growth so that it first occurs in areas outside of prime farmland, the DEIR should include a mitigation measure that requires that every acre of farmland that is converted must be mitigated by preserving, at a minimum, one acre of farmland of equal or greater quality in the area. Another common, feasible, and effective practice is to purchase agricultural conservation easements to prevent the loss of agricultural land. These are but a few of the many mitigation strategies the DEIR should consider in a recirculated document.

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**The DEIR fails to convey whether and how much growth is anticipated to occur outside of Vacaville’s Voter-Approved Urban Growth Boundary**

The City of Vacaville has a clearly defined voter-approved Urban Growth Boundary (UGB). The current DEIR proposes 2,640 acres of development in areas considered farmland of concern, which is more than the 2,500 acres of agricultural land shown to be within Vacaville’s Sphere of Influence and UGB in the Energy and Conservation Action Strategy (ECAS, section 1-15). The DEIR does not explicitly show the extent of development outside of the UGB. The Plan should be clarified to ensure that no urban development occurs outside of the UGB and the recirculated DEIR must show the entire geographic extent of proposed development.

12-22

**The DEIR fails to provide an adequate alternative for infill growth**

This General Plan Update offers the City of Vacaville a great opportunity to create compact development that will accommodate future growth in thriving neighborhoods, while also ensuring a more fiscally sustainable budget and protecting natural resources and open spaces.

Although the General Plan DEIR identifies two alternative land use scenarios, each of these alternative land use scenarios includes extensive development on open space and agricultural lands with little or no infill development. The DEIR fails to include the obvious land use scenario that calls for *urban infill development*. In the current regional planning context, the City of Vacaville needs to include at least one alternative that focuses growth on infill-oriented development. This will enhance the DEIR’s usefulness for evaluating the land use and transportation impacts of development, as well as demonstrate compliance with the intent of CEQA and statewide goals for reducing greenhouse gas emissions.

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**The DEIR fails to adequately analyze and mitigate effects on biological resources**

The City of Vacaville has a multitude of sensitive natural communities and special-status species that have the potential to occur in the General Plan study area. The DEIR acknowledges the potential conversion of about 6,900 acres of habitat to various land uses including, residential, commercial, and industrial (DEIR, section 4.4-50). Most of these undeveloped lands provide

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habitat for one or more of the 28 special-status wildlife species and the 19 special status plant species that could potentially occur in the EIR Study Area.

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cont.

Even with such biological diversity, the DEIR fails to sufficiently describe these resources because it relies on database searches rather than botanical surveys. Surveys are one of the preliminary steps to detect the presence of special-status plant species or a natural community. In the absence of surveys to determine the specific characteristics of a wildlife species' use of the habitat, the DEIR undercuts the legitimacy of the environmental impact analysis. Moreover, based upon a modest survey analysis, the DEIR concludes that impacts to certain habitats will be significant, yet the DEIR does not identify the specific locations of habitats that would be eliminated or impacted by the Project. The DEIR must explain how it arrived at its conclusions. Accordingly, the revised EIR should include maps that overlay proposed development locations on sensitive habitats. Once this information is provided, it may be possible to evaluate alternative locations for certain development that would protect these sensitive communities and the species that rely on them.

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Once again, a recirculated DEIR should consider an urban infill land use alternative to provide the public and decision-makers with information on how compact development could potentially decrease significant and irreversible impacts on biological resources. It should also identify how land use patterns in areas outside of currently urbanized areas could be improved to reduce impacts on sensitive habitats and species.

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**The DEIR's transportation impact analysis is woefully inadequate, resulting in meaningless targets and goals out of compliance with local, county, regional and state policy**

The DEIR fails to evaluate the General Plan's transportation impacts against an accurate baseline. Rather than compare existing transportation conditions with the proposed General Plan, the DEIR compares the number of proposed trips to the 1990 General Plan. Specifically, the DEIR states that the number of trips due to the proposed General Plan would be "within 1 percent of the 2035 trips generated with the 1990 General Plan" (DEIR at 4.14-37). Comparing environmental impacts to a plan, rather than existing conditions, is inconsistent with CEQA case law.

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The General Plan has the potential to result in a significant increase in traffic impacts compared to existing conditions. Indeed, DEIR Table 4.14-8 reveals that the General Plan would *increase the number of daily trips in Vacaville by 48 percent* and the number of peak-hour trips will increase by 47-50 percent, which is obviously substantially greater than the one percent value assumed in the DEIR.

Again, appropriate mitigation measures for the potential significant increases in vehicle trips are left out of the DEIR. In particular, the DEIR uses transportation system improvements without designated funding sources as mitigation strategies. These "mitigations" are purely speculative.

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Without any meaningful indication of the availability of adequate funding for the necessary transportation system improvements it is impossible to state with certainty that the improvements are feasible. Thus, it is inappropriate to conclude that the associated impacts will be reduced to less than significant.

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cont.

Conclusion

As this letter demonstrates, the City of Vacaville’s General Plan Update DEIR clearly requires extensive new information and analysis. This analysis will likely result in the identification of new, substantial environmental impacts or substantial increases in the severity of significant environmental impacts. Moreover, the flaws that permeate the entire document, particularly the DEIR’s use of the Horizon Year Projection, constitute precisely the sort of pervasive flaws in the document that independently require *recirculation* under CEQA Guidelines section 15088.5(a)(4).

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Greenbelt Alliance expects that in the process of revising the DEIR, the City will also re-scope the document to include an alternative that prioritizes urban infill development. This will provide the City and the public a realistic analysis of land use and transportation alternatives that could substantially reduce the negative impacts of sprawl development. Moreover, we encourage the City to work collaboratively with organizations (both government and non-governmental alike) that can provide the tools and strategies for a DEIR that meets CEQA requirements and will create great communities in Vacaville well into the future.

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Sincerely,

/s/

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December 18, 2013

Via E-mail

Tyra Hays, Project Manager  
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Development Department  
650 Merchant Street,  
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Re: City of Vacaville General Plan and Energy and Conservation  
Strategy Draft Environmental Impact Report

Dear Ms. Hays:

We have been retained by the Solano County Orderly Growth Committee to review and comment on the draft environmental impact report (“DEIR”)for the City of Vacaville General Plan and Energy and Conservation Strategy (“Project”). Our review of the DEIR reveals serious violations of the California Environmental Quality Act (“CEQA”) (Public Resources Code section 21000 *et seq.*) and CEQA Guidelines (California Code of Regulations, title 14 section 15000 *et seq.*).

13-1

The DEIR is fundamentally inconsistent with CEQA. Its failure to provide an adequate description of the Project – one that accounts for the land uses and types of development actually permitted by the General Plan – fatally undermines its analysis of environmental impacts as well as its discussion of potential mitigation measures. The DEIR also fundamentally fails to disclose, analyze, and propose mitigation for environmental impacts that it merely assumes will be less than significant. The countless vague, voluntary, and unenforceable policies cited as mitigation measures in the DEIR fail to comply with CEQA, which requires enforceable, concrete commitments to mitigation. As a result, the DEIR completely fails to describe measures that could avoid or substantially lessen the General Plan’s numerous significant impacts. The pervasive flaws in the document demand that the DEIR be substantially modified and recirculated for review and comment by the public and public agencies.

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For all the reasons set forth below, it is our opinion that the DEIR does not comply with the requirements of CEQA. The City must revise and recirculate the DEIR to provide the public an accurate assessment of the environmental issues at stake, and a mitigation strategy—developed *before* General Plan approval—that fully addresses the Project’s significant impacts. The City must also take a serious look at alternatives that can avoid or lessen the Project’s significant impacts.

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This letter, along with the transportation report prepared by MRO Engineers (Exhibit A) constitutes our comments on the DEIR. We respectfully refer the City, both here and throughout these comments, to this transportation report for further detail and discussion of the DEIR’s inadequacies with regard to impacts to transportation.

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**I. General Comments**

The following are our general comments on the legal inadequacies of the DEIR. More specific comments on individual sections of the document follow.

13-7

**A. The DEIR Improperly Attempts to Avoid Analysis and Mitigation of the General Plan’s Impacts by Concluding that They Are Significant and Unavoidable.**

Where all available and feasible mitigation measures have been proposed but are inadequate to reduce an environmental impact to a less-than-significant level, an EIR may conclude that the impact is significant and unavoidable. *See* Cal. Code Regs., tit. 14 (“CEQA Guidelines”), § 15126.2. If supported by substantial evidence, the lead agency may make findings of overriding considerations and approve the project in spite of its significant and unavoidable impacts. *Id.* at §§ 15091, 15093. However, the lead agency cannot simply conclude that an impact is significant and unavoidable and move on. A conclusion of residual significance does not excuse the agency from (1) performing a thorough evaluation and description of the impact and its severity before and after mitigation, and (2) proposing *all* feasible mitigation to “substantially lessen the significant environmental effect.” CEQA Guidelines § 15091(a)(1); *see also id.* § 15126.2(b) (requiring an EIR to discuss “any significant impacts, *including those which can be mitigated but not reduced to a level of insignificance*” (emphasis added). “A mitigation measure may reduce or minimize a significant impact without avoiding the impact entirely.” 1 Stephen Kostka & Michael Zischke, *Practice Under the California Environmental Quality Act* § 14.6 (2d ed. 2008).

13-8

The DEIR finds a staggering 30 areas of significant and unavoidable impacts. DEIR at 2-6 – 2-20. As detailed below, in numerous instances, the DEIR fails to thoroughly assess impacts deemed to be significant and unavoidable or to identify all feasible mitigation measures to reduce the severity of the impacts.

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cont.

**B. Changes to the Land Use Designations and Densities and Intensities Proposed in the General Plan Are Feasible Mitigation Ignored in the DEIR.**

For many of the General Plan’s 30 significant and unavoidable impacts, the DEIR concludes that no feasible mitigation is available. Nevertheless, nowhere in the DEIR does the document consider changes to land use designations or densities and intensities as potential mitigation. CEQA requires the EIR to consider such mitigation.

The City cannot approve projects with significant environmental impacts if any feasible mitigation measure or alternative is available that will substantially lessen the severity of any impact. Pub. Res. Code § 21002; CEQA Guidelines § 15126(a). The City is legally required to mitigate or avoid the significant impacts of the projects it approves whenever it is feasible to do so. Pub. Res. Code § 21002.1(b). “In the case of the adoption of a plan, policy, regulation, or other public project [such as the General Plan], mitigation measures can be incorporated into the plan, policy, regulation, or project design.” CEQA Guidelines § 15126.4(a)(2). Mitigation is defined by CEQA to include “[m]inimizing impacts by limiting the degree or magnitude of the action and its implementation.” CEQA Guidelines § 15370(b). Nothing in the statute, Guidelines, or case law limits the City to proposing new “policies” as mitigation, as opposed to proposing changes in where development is planned, what kind is planned, and how dense or intense that development is planned to be, i.e., changes to land use diagram and land use designations.

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There is no indication that the DEIR considered modifications to land use designations or densities and intensities to mitigate the impacts of the General Plan. Yet those changes are the easiest, most effective, and most obvious ways to lessen or avoid many of the General Plan’s impacts. For example, the Plan will result in a substantial loss of farmland of concern resulting from the planned development in areas such as the East of Leisure Town Road Growth Area. Because this development is removed from Vacaville’s urban areas, it will result in increased travel, which, in turn, will result in increased criteria air pollutants and greenhouse gas emissions. Exploring alternative land use scenarios would go a long way toward reducing numerous General Plan impacts,

such as air quality, climate change, biological resources, agriculture, traffic, wildfire hazards, and flood risks.

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cont.

**C. Merely Hortatory General Plan Policies Are Inadequate as Mitigation for CEQA Purposes.**

Mitigation measures proposed in an EIR must be “fully enforceable” through permit conditions, agreements, or other legally binding instruments. Pub. Res. Code § 21081.6(b); CEQA Guidelines § 15126.4(a)(2). Many of the General Plan’s policies and programs relied on to mitigate impacts are vague, optional, directory, or otherwise unenforceable. A few examples—out of numerous instances—include the following (emphases added):

- Policy COS-P2.1: “discourages undergrounding of creeks and encourages daylighting of existing culverted creeks.” DEIR at 4.1-10.
- Policy COS-P2.5: encourages restoration and expansion of riparian and floodplain habitat within channelized streams and flood channels where feasible. *Id.*
- Policy COS-P1.1 supports efforts to prepare and implement the HCP. *Id.* at 4.4-53.
- Policy COS-P1.11 requires that, as appropriate, new policy plans or specific plans contain a resource management component and associated funding mechanisms that includes policies to protect preserved natural communities. *Id.*
- Policy COS-P1.3 directs the protection and creation of new wildlife corridors where feasible. *Id.* at 4.4-56.
- Policy COS-P12.3 encourages project designs that protect and improve air quality, and minimize direct and indirect air pollutant emissions by including components that reduce vehicle trips and promote energy efficiency. *Id.* at 4.3-20.

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A general plan’s goals and policies are necessarily somewhat vague and aspirational. However, the City may rely on such policies to mitigate environmental impacts under CEQA only if they are proposed to be implemented through specific

implementation programs that represent a firm, enforceable commitment to mitigate. *See Napa Citizens for Honest Gov't v. Napa County Bd. of Supervisors*, 91 Cal. App. 4th 342, 358 (2001) (citing *Rio Vista Farm Bureau Center v. County of Solano*, 5 Cal. App. 4th 351, 377 (1992)). CEQA requires that mitigation measures actually be implemented—not merely adopted and then disregarded. *Anderson First Coalition v. City of Anderson*, 130 Cal. App. 4th 1173, 1186-87 (2005); *Fed'n of Hillside & Canyon Ass'ns v. City of Los Angeles*, 83 Cal. App. 4th 1252, 1261 (2000).

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cont.

By contrast, the General Plan's vague and noncommittal policies and programs (and policies for which no implementation programs are identified) allow the City to decide to take no action and thus fail to mitigate impacts. As a result, the DEIR cannot ensure that the policies relied on will in fact be implemented to mitigate the General Plan's impacts, and therefore they cannot serve as CEQA mitigation. *See Anderson First*, 130 Cal. App. 4th at 1186-87.

## **II. The DEIR's Use of Two Development Scenarios in the Project Description and Impact Analysis Is Misleading and Unlawful.**

The DEIR purports to analyze the impacts of the General Plan under two scenarios: "Full Buildout" that assumes development will occur as permitted by the General Plan, and a "Horizon-Year Projection" that assumes that development will occur at significantly less intensity than allowed under the General Plan. DEIR at 3-31. This dual scenario approach is unlawful and is misleading because it underestimates the impacts of the General Plan as proposed.

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### **A. CEQA Requires that the DEIR Analyze the Potential Impacts of the Development as Permitted Under the General Plan.**

Courts have consistently held that an EIR must examine a project's *potential* to impact the environment, even if the development may not ultimately materialize. *Bozung v. Local Agency Formation Comm'n*, 13 Cal. 3d 263, 279, 282 (1975). Because general plans serve as the crucial "first step" toward approving future development projects, a general plan EIR must evaluate the amount of development actually allowed by the plan. *City of Carmel-By-the-Sea v. Bd. of Supervisors of Monterey County*, 183 Cal. App. 3d 229, 244 (1986); *City of Redlands v. County of San Bernardino*, 96 Cal. App. 4th 398, 409 (2002). Thus, an agency may not avoid analysis of such development merely because historic and/or projected land use trends indicate that the development might not occur.

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In *San Joaquin Raptor Rescue Center v. County of Merced*, 149 Cal. App. 4th 645 (2007), the Court of Appeal confirmed an agency’s obligation to describe and analyze the impacts from the whole project, and “not some smaller portion of it.” *Id.* at 654. The project at issue in *San Joaquin Raptor* was a new Conditional Use Permit (“CUP”) for an existing aggregate mine and processing operation. The new CUP authorized a maximum production level of 550,000 tons per year, which was an increase over existing levels. However, historic mine production rates indicated that actual production could be less than the theoretical maximum. Based on historic rates and projected future rates, the EIR “estimated average production of about 260,000 tons per year.” *Id.* at 655. The court held that the EIR’s identification of the estimated average in the project description, rather than the maximum level of production authorized by the CUP, violated CEQA. The court stated: “By giving such conflicting signals to decisionmakers and the public about the nature and scope of the activity being proposed, the Project description was fundamentally inadequate and misleading.” *Id.* at 655-56.

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The Court of Appeal in *Stanislaus Natural Heritage Project v. County of Stanislaus*, 48 Cal. App. 4th 182 (1996), reached a similar conclusion in a slightly different context. The county argued that an EIR can avoid providing a full analysis of water supply for future phases of a proposed development project because the EIR included a mitigation measure that would prevent development of those future phases until a water supply had been identified. The court rejected this argument and held that a lead agency must assume that a project will be developed *as planned* and must evaluate the impacts of the *planned* project, not a potential, more limited project. *Id.* at 205-06.

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The DEIR attempts to justify its failure to describe and analyze the entirety of the General Plan by stating that it need only “evaluate the ‘reasonably foreseeable’ direct and indirect impacts of the proposed project.” DEIR at 3-31. The City has taken the “reasonably foreseeable” language from the definition of project under the CEQA Guidelines, but has misinterpreted its meaning. Under CEQA, a project means “*the whole of an action*, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment . . . .” CEQA Guidelines § 15378(a). “Reasonably foreseeable” describes the likelihood of indirect impacts; it does not suggest that an EIR need only evaluate the “reasonably foreseeable” aspects of a project. Rather, it makes clear that a project is a “whole of an action.” Here, the whole of the action is the level of development permitted under the General Plan. If the City would like to limit its analysis to a predicted amount of growth, it must also limit the allowable development to that lower level by placing those restrictions in the General Plan itself.

13-15

**B. By Improperly Describing the Project as the Horizon-Year Projection, the DEIR Underestimates the Extent of the General Plan’s Impacts.**

As explained above, the *Project* that must be described and analyzed in the DEIR is the Full Buildout, not the Horizon-Year Projection. The importance of this distinction is not merely theoretical. The Full Buildout allows for two times more dwelling units and retail space and approximately nine times as much new commercial space and industrial space, as is assumed under the Horizon-Year Projection. Because the DEIR improperly fails to assume development as allowed under the General Plan, it significantly underestimates the Project’s impacts.

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Accordingly, the DEIR is fundamentally misleading to the public and decisionmakers, in violation of CEQA. “[O]nly through an accurate view of the project may the public and interested parties and public agencies balance the proposed project’s benefits against its environmental cost, consider appropriate mitigation measures, assess the advantages of terminating the proposal and properly weigh other alternatives.” *City of Santee v. County of San Diego*, 214 Cal. App. 3d 1438, 1454 (1989). Thus, because the DEIR fails to describe the Project properly, it fails to serve its purpose as an informational document. *See San Joaquin Raptor Rescue*, 149 Cal. App. 3d at 674.

In the limited places where it mentions the Full Buildout, the DEIR’s analysis of impacts under the Full Buildout is purely perfunctory. That analysis is limited to one paragraph at the end of each impact discussion and includes only generic statements that the impact will be of the same kind as that caused by the Horizon-Year Projection, only worse. For example, the DEIR states that Full Buildout “would include significantly more development than the [Horizon-Year Projection] in terms of both the amount and extent of development. Therefore, the potential for impacts to agriculture and forestry resources would increase.” DEIR at 4.2-25; *see also, e.g.*, DEIR at 4.3-32 (air quality impacts will be more significant under Full Buildout). The DEIR makes no attempt to quantify the impacts on agriculture, air quality or any other impact area under the Full Buildout despite the fact that this scenario is *the Project*. Moreover, the DEIR never identifies new or different mitigation measures to lessen the more significant impacts that will occur under the Full Buildout, as compared to the Horizon-Year Projection.

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**III. The DEIR’s Analyses of and Mitigation for the General Plan’s Environmental Impacts Are Legally Inadequate.**

The DEIR’s impact sections for the most part simply name potential impacts of the Project and cite General Plan policies to conclude impacts would be less than

13-18

significant. The DEIR rarely quantifies the impacts or describes their nature and extent. Its analyses read more like a set of general discussions of these types of impacts in a generic location anywhere in California, rather than analyses of how *this* General Plan will effect *this* City. The DEIR’s impact analyses are universally flawed in this manner, because none of them considers the Project actually put forth by the proposed General Plan.

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cont.

The “programmatically” nature of this DEIR is no excuse for its lack of detailed analysis. Indeed, the DEIR grossly misconstrues both the meaning and requirements of a “program” EIR by referring to it as a document that “assesses and documents the broad environmental impacts of the program with the understanding that a more detailed site-specific analysis may be required to assess future projects implemented under the program.” DEIR at 1-2. This approach is flawed, at the outset, because CEQA requires that a program EIR provide an in-depth analysis of a large project, looking at effects “as specifically and comprehensively as possible.” CEQA Guidelines § 15168(a), (c)(5). Because it looks at the big picture, a program EIR must provide “more exhaustive consideration” of effects and alternatives than can be accommodated by an EIR for an individual action, and must consider “cumulative impacts that might be slighted by a case-by-case analysis.” CEQA Guidelines § 15168(b)(1)-(2).

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Further, it is only at this early stage that the City can design wide-ranging measures to mitigate City-wide environmental impacts. *See* CEQA Guidelines § 15168(b)(4) (programmatically EIR “[a]llows the lead agency to consider broad policy alternatives and program wide mitigation measures at an early time when the agency has greater flexibility. . .”). A “program” or “first tier” EIR is expressly not a device to be used for deferring the analysis of significant environmental impacts. *Stanislaus Natural Heritage Project v. County of Stanislaus*, 48 Cal. App. 4th 182, 199 (1996). It is instead an opportunity to analyze impacts common to a series of smaller projects, in order to avoid repetitious analyses. Thus, it is particularly important that the DEIR for the General Plan analyze the overall impacts for the complete level of development it is authorizing now, rather than when individual specific projects are proposed at a later time.

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In addition to considering full buildout, another indispensable component of a complete assessment of Project impacts is an accurate depiction of existing environmental conditions. Investigating and reporting existing conditions are “crucial function[s] of the EIR.” *Save Our Peninsula Comm. v. Monterey County*, 87 Cal. App. 4th 99, 122 (2001) (“SOPC”). “[W]ithout such a description, analysis of impacts, mitigation measures and project alternatives becomes impossible.” *County of Amador v. El Dorado County Water Agency*, 76 Cal. App. 4th 931, 953 (1999) . Decision-makers

13-21

must be able to weigh the project’s effects against “real conditions on the ground.” *City of Carmel-by-the-Sea*, 183 Cal. App. 3d at 246. “Because the chief purpose of the EIR is to provide detailed information regarding the significant environmental effects of the proposed project on the physical conditions which exist within the area, it follows that the existing conditions must be determined.” *SOPC*, 87 Cal. App. 4th at 120 (internal quotations omitted). Therefore, the DEIR must present the existing acreage and dwelling units or floor area of existing uses and uses proposed within the planning area. The document must also show or describe *where* the new uses proposed would represent changes from existing uses.

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cont.

The DEIR, here, fails to provide the legally required analysis of the substantial growth that the General Plan allows and promotes. Thus, the City must revise the DEIR to accurately disclose the impacts of the maximum density allowed by the General Plan it does propose to adopt. Below, this letter details the specific legal inadequacies of the DEIR’s various impact sections.

13-22

**A. The DEIR’s Analysis of and Mitigation for the General Plan’s Agricultural Impacts Is Inadequate.**

The DEIR recognizes that agriculture is a significant economic resource within Solano County and points out that the Solano County General Plan focuses, to a large extent, on preserving this important resource. DEIR at 4.2-3. 10,407 acres of agricultural land is located within the EIR Study Area; 2,793 acres, or 27%, of which is prime farmland, farmland of statewide importance, or unique farmland (“farmland of concern”). DEIR at Table 4.2-1.

The Legislature has repeatedly asserted that preservation and protection of state farmland is an important policy goal and that CEQA is an important tool that should be used to carry out this goal. *Masonite Corp. v. Cnty. of Mendocino*, 218 Cal. App. 4th 230, 240 -241 (2013) (“our Legislature has repeatedly stated the preservation of agricultural land is an important public policy”). In particular, “[a]gricultural lands near urban areas that are maintained in productive agricultural use [such as the ones near Vacaville] are a significant part of California’s agricultural heritage.... Conserving these lands is necessary due to increasing development pressures and the effects of urbanization on farmland close to cities.” Pub. Resources Code, § 10201(c). “The Legislature has also declared that CEQA is intended to effectuate this public policy.” *Masonite Corp.*, 218 Cal. App. 4th at 241.

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Yet, despite the importance of agricultural resources to the City, County, and State, the DEIR fails to adequately describe the impacts to agricultural resources and wholly fails to identify any mitigation measures to avoid or mitigate the loss of agricultural land. Accordingly, the DEIR’s discussion of agricultural resources, not only fails to effectuate an important public policy, but also fails to meet the basic requirements of CEQA.

13-23  
cont.

**1. The DEIR Fails to Adequately Describe Impacts to Agricultural Lands (Impact AG-1).**

The DEIR finds that 2,640 acres of farmland of concern could be converted to non-agricultural uses under the General Plan. DEIR at 4.2-18. As stated above, 2,793 acres of farmland of concern are located within the EIR Study Area. Therefore, the General Plan is proposing to convert almost all of this protected resource.

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It is unclear from the DEIR’s description of impacts how much of the 2,640 acres of farmland of concern that will be developed is located outside the Urban Growth Boundary (“UGB”). The Energy and Conservation Action Strategy (“ECAS”) states that there are only 2,500 acres of agricultural land within Vacaville’s Sphere of Influence and UGB. ECAS at 1-15. Logically, the General Plan must allow for development of agricultural land outside the UGB. However, the DEIR also states that “[I]and outside the UGB *cannot be designated* for anything other than agricultural, park, open space, public facility, and utility uses.” DEIR at 3-17 (emphasis added). The revised EIR should clarify how much of the converted agricultural land is outside the UGB, and how this development complies or does not comply with the prohibition on developing land outside the UGB.

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Further, the DEIR only describes the loss of farmland of concern. The majority of farmland within the EIR Study Area is grazing land. DEIR at Table 4.2-1. Yet the DEIR does not state how much of this land will be converted to non-agricultural uses under the General Plan. The revised EIR should fully disclose and mitigate for this impact.

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Finally, the DEIR is internally consistent about whether the 2,640 acres is the full amount of agricultural land that will be allowed to be converted under the General Plan or whether it is the amount of development that the DEIR assumes is likely under the horizon-year projection. On the one hand, the DEIR states that it analyzed impacts to agricultural resources assuming that all development allowed by the General Plan will occur. DEIR at 3-51 (“all potential development allowed by the land use map of the proposed General Plan was evaluated to assess impacts to [agriculture]”). Yet later the

13-27

DEIR indicates that it evaluated the loss to agricultural resources under the 2035 horizon-year projection. At the end of the agricultural section, the DEIR states that “[t]he full buildout anticipated under the proposed General Plan would include significantly more development than the 2035 horizon-year development projection . . . in terms of both the amount and extent of development.” DEIR at 4.2-25. The EIR must clarify whether its analysis of agricultural impacts is based on the development that will occur under the horizon-year projection or the development allowed for under the General Plan.

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cont.

As explained above, the EIR must assume, and mitigate for, the impacts caused by all development allowed for under the General Plan. Assuming the DEIR is evaluating the impacts under the horizon-year projection, it must be amended to fully describe the impacts that will occur under the full buildout and propose feasible and effective mitigation measures for this loss of farmland.

**2. The DEIR Neglects Feasible Mitigation for the Loss of Farmland.**

The DEIR concludes that the loss of agricultural land under the General Plan is a significant impact and that no mitigation is available for this impact. DEIR at 4.2-18. The DEIR states that “[t]he only way to mitigate this impact would be to prohibit any development on farmland of concern, even within the UGB.” *Id.*

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Here again the DEIR makes the assumption that because feasible mitigation cannot wholly eliminate the impact, the DEIR need not identify any mitigation at all. As discussed above, this conclusion is legally erroneous. *See supra* Section I.A. The DEIR must identify any and all feasible mitigation measures even if they will not reduce the impact to a less than significant level. CEQA Guidelines § 15126.2(b).

In fact, numerous feasible measures are available to reduce the severity of this impact. First and foremost, the DEIR should identify ways in which the General Plan could avoid developing agricultural land, in particular the most productive farmland such as prime farmland and other farmland of concern.

Currently, the General Plan does the opposite of this; it identifies two growth areas on the east side of the City, both of which are located in areas of prime farmland, the most productive type of farmland. These growth areas, the Northeast Growth Area and the East of Leisure Town Road Growth Area, are located within two agricultural regions, the Dixon Region and the Elmira Maine Prairie. *See* DEIR at Figure 3-5, Figure 4.2-3. Agricultural land in the Dixon Region is the “second most valuable land in Solano

13-29

County.” DEIR at 4.2-12. Solano County General Plan Policy AG.P-28 states that “preservation efforts should be focused and conflicting land uses avoided” in both the Dixon and Elmira Maine Prairie Regions. Solano County General Plan at AG-31. Proposing to develop these areas — the most valuable farmland near Vacaville — is contrary to Solano County’s General Plan and is illogical if the Vacaville purports to protect key agricultural lands.

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cont.

Rather, the DEIR should propose mitigation measures to avoid these areas. Avoiding the development of farmland of concern is not only the simplest and most effective way to protect agricultural resources, but it is also feasible. Eleven percent (11%) of the land within the City limits is currently vacant. DEIR at 4.10-10. Instead of focusing development in these vacant areas, the General Plan allows for, and the DEIR assumes that, the growth areas will be some of the first areas to be developed. DEIR at Figure 3-6. The DEIR must propose mitigation measures that would ensure that the vacant areas within the City limits are developed before areas with farmland of concern.

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In addition to reducing the amount of farmland of concern that is designated for nonagricultural use, the DEIR should also analyze the following mitigation measures that would lessen impacts to this resource:

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- Expanding minimum parcel size on farmland of concern in the agricultural regions;
- Restricting subdivision of farmland of concern;
- Expanding the Agricultural Reserve Overlay to include additional farmland of concern; and
- Opting into the Farmland Security Zone program established by 1998 amendments to the Williamson Act (referred to as the “Super Williamson Act”), 1998 Cal. Stat. ch. 353, which provides additional incentives to preserve agricultural land by reducing property taxes.

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Finally, if farmland cannot be avoided or preserved, the DEIR should include a mitigation measure that requires that every acre of farmland that is converted must be mitigated by preserving, at a minimum, one acre of farmland of equal or greater quality in the area. The proposed General Plan includes Policy LU-P2.4, which requires development in the East of Leisure Town Road Growth Area to purchase conservation easements to permanently protect lands within the Permanent Agricultural Overlay at a

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ratio of 1:1. DEIR at 4.1-17–4.1-18. Although this policy mitigates for a portion of the agricultural land that the General Plan allows to be developed, it falls short of proposing to lessen the environmental impacts of the loss of all agricultural land.

The purchase of agricultural conservation easements is a feasible and effective way of mitigating the loss of agricultural land. *See Masonite Corp.*, 218 Cal. App. 4th at 237-241. There is no reason that a requirement to purchase conservation easements should be limited to the loss of agricultural land in the East of Leisure Town Road Growth Area. The DEIR must propose to modify this policy to require that development of agricultural land in any area under Vacaville’s control be mitigated at a minimum 1:1 ratio. Moreover, if land is unavailable in the Permanent Agricultural Overlay, any mitigation measure should specify that conversion of farmland must be mitigated by preserving an area of farmland designated with the same subcategory of farmland of concern (prime farmland, unique farmland, and farmland of statewide significance).

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**3. The DEIR Does Not Support Its Conclusion that No Feasible Mitigation Exists for Loss of Agricultural Land Subject to Williamson Act Contracts (Impact AG-2).**

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As discussed for Impact AG-1, the DEIR errs in concluding that it need not propose mitigation unless that mitigation is sufficient to reduce the impact to a less-than-significant level. DEIR at 4.2-20. The DEIR also fails to support its conclusion that there is no feasible mitigation for this impact. *Id.* The mitigation measures discussed above for Impact AG-1 apply here as well. These measures encourage the preservation of a larger area of farmland in Solano County. As a result, they necessarily also provide an incentive for the retention of Williamson Act contracts on that farmland to reduce the owners’ property tax liability.

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**4. The DEIR Fails to Adequately Identify and Analyze the Project’s Cumulative Impacts to Agriculture.**

An EIR must discuss significant cumulative impacts. CEQA Guidelines § 15130(a). Cumulative impacts are defined as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. CEQA Guidelines § 15355(a). “[I]ndividual effects may be changes resulting from a single project or a number of separate projects. CEQA Guidelines § 15355(a). A legally adequate cumulative impacts analysis views a particular project over time and in conjunction with other related past, present, and reasonably foreseeable future projects whose impacts might compound or interrelate with

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those of the project at hand. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. CEQA Guidelines § 15355(b). The cumulative impacts concept recognizes that “[t]he full environmental impact of a proposed . . . action cannot be gauged in a vacuum.” *Whitman v. Board of Supervisors*, 88 Cal. App. 3d 397, 408 (1979) (internal quotation omitted).

Here, the DEIR’s discussion of cumulative impacts to agriculture is merely cursory and conclusory. The DEIR fails to analyze the General Plan’s effects on agriculture together with the effects of past, present, and future development projects. Instead, it simply concludes that because the Project will contribute to loss of agricultural land in Solano County generally, the cumulative impacts are significant. The EIR must be revised to include a proper cumulative analysis for agricultural resources. As regard to the cumulative analysis, the EIR preparers must examine the combined effects of both the proposed General Plan and other identified projects.

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Moreover, the DEIR must identify mitigation measures to lessen the cumulative impacts. Again, the DEIR states merely that “the decisions of surrounding counties regarding the conversion of agricultural land are outside the control of Vacaville.” DEIR at 4.2-24. However, the decision to convert land within Vacaville is entirely under the control of the City. Yet the General Plan suggests converting almost all agricultural lands to urban uses. The DEIR must identify mitigation measures, such as the ones suggested above, to mitigate its cumulative contribution to this impact.

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**B. The DEIR’s Analysis of and Mitigation for the General Plan’s Biological Resources Impacts Is Inadequate.**

The City of Vacaville has a multitude of sensitive natural communities and an astonishing array of special-status species that have the potential to occur in the General Plan study area. The DEIR acknowledges the potential conversion of about 6,900 acres of habitat areas to various land uses including, residential, commercial, and industrial. DEIR at 4.4-50. Most of these undeveloped lands provide habitat for one or more of the 28 special-status wildlife species and the 19 special status plant species that could potentially occur in the EIR Study Area. *Id.* at 4.4-22, 4.4-32, 4.4-50.

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Given this rich array of plant and wildlife that inhabit the area, one would expect the DEIR to provide a comprehensive analysis of the effect that implementation of the General Plan would have on these resources. Yet the DEIR does no such thing. It does not provide sufficient information about the resources that exist because it fails to

conduct any botanical surveys. With very few exceptions, the document provides no explanation of the species' needs and their status—a discussion, that is, of how rare they are locally and overall, and how development under the General Plan might threaten them. Nor does the DEIR provide the necessary evidentiary support that impacts to these sensitive natural communities and plant and wildlife species would be less than significant. Finally, the DEIR fails to adequately analyze and mitigate the Project's cumulative effects on these resources.

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cont.

**1. The DEIR Fails to Adequately Describe the Site's Biological Resources.**

The DEIR explains that the Project may impact at least 28 special-status wildlife species and 19 special-status plant species because these species have the *potential to occur* in the EIR Study Area. DEIR at 4.4-22, 4.4-32, 4.4-50. Yet the DEIR fails to sufficiently describe these resources because it relies on database searches rather than botanical surveys. Surveys are one of the preliminary steps to detect the presence of special-status plant species or a natural community. In the absence of surveys to determine the specific characteristics of a wildlife species' use of habitat, the DEIR undercuts the legitimacy of the environmental impact analysis.

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Rather than conduct surveys, the DEIR asserts, absent any factual support, that surveying is infeasible. DEIR at 4.4-52. The document further states that such surveys would not be useful since development would take place over the course of many years and the conditions on each site will change over time. *Id.* To the contrary, the time to conduct these surveys – and the associated environmental impact analysis – is now, so that the decision-makers can be informed of the severity and extent of the General Plan's impacts and so that mitigation measures can be identified. Moreover, there may not be further environmental review for many of these land use projects. Under these circumstances — and especially where the EIR concludes the impacts will be potentially significant — the environmental impact analysis must be performed now.

As the Court of Appeal recently explained in *Stanislaus Natural Heritage Project v. County of Stanislaus*, 48 Cal. App. 4<sup>th</sup> 182 (1996), CEQA requires that this environmental review take place *before* project approval. *Id.* at 196 (citing *Laurel Heights II* for the proposition that a fundamental purpose of CEQA is to inform the public and responsible officials of the environmental consequences of their decisions before they are made). The court specifically rejected the argument that a programmatic EIR for a specific plan and general plan amendment could ignore site-specific

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environmental review because future phases of the development project would include environmental review, stating that tiering is not a device for deferring the identification of significant environmental impacts that the adoption of a specific plan can be expected to cause. *Id.* at 199. The court emphasized that agencies should expect environmental analysis to involve some degree of forecasting:

We do not by this opinion place any new burdens on preparers of EIRs. Our opinion today is merely an affirmation of already existing law. Drafting an EIR . . . necessarily involves some degree of forecasting. While forecasting the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can.

*Id.* at 206, citing CEQA Guidelines § 15144.

CEQA also requires that project descriptions and environmental impact assessments account for reasonably foreseeable future phases, or other reasonably foreseeable consequences of proposed projects. *Laurel Heights Improvement Assn. v. Regents of University of California*, 47 Cal. 3d 376, 393-399 (“*Laurel Heights I*”). In *Laurel Heights I*, the California Supreme Court required that an EIR analyze future effects of project expansion or other action where (1) it is a reasonably foreseeable consequence of the initial project; and (2) the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects. *Id.* at 396. In that case, the court required the University’s EIR to discuss the future expansion of its project in order to inform decision-makers and the public about the impacts that would likely occur. *Id.* Here, environmental review is even more clearly required, as the proposed General Plan clearly facilitates land use development on these environmentally sensitive lands.

In sum, since the EIR skips the crucial first step of its environmental impact analysis, it likely understates the Project’s potential impacts and fails to identify effective mitigation. Thus, the revised EIR must include comprehensive botanical surveys to describe the existing environment.

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**2. The EIR Fails to Adequately Analyze the Project’s Impacts on Biological Resources.**

The DEIR errs further because it lacks the necessary detail about the Project’s potential direct and indirect effects on sensitive species and natural communities that potentially occur in the study area. As discussed above, in the absence of botanical surveys, the EIR cannot do its job. Because the DEIR fails to establish a baseline, it is unable to compare the locations of habitat and species to the locations of development. Not surprisingly, in most instances, the DEIR includes only cursory conclusions that the potential for impacts exist, but does not contain any substantive analysis of those impacts.

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For example, although the DEIR concludes that impacts to certain habitats will be significant, the DEIR does not identify the specific locations of habitats that would be eliminated or impacted by the Project (*see, e.g.*, DEIR at 4.4-53, acknowledging that the Project would result in the loss of “several isolated wetlands” but omitting the location of these wetlands; *see also* DEIR at 5.4-55, stating that the Project will impact 33 acres of riparian, stream, and freshwater marsh habitat but failing to identify the location of these habitats). Simply stating that an impact is significant is insufficient. Meaningful analysis of impacts effectuates one of CEQA’s fundamental purposes: to “inform the public and responsible officials of the environmental consequences of their decisions before they are made.” *Laurel Heights Improvement Ass’n v. Regents of the University of California*, 6 Cal.4th 1112, 1123 (1993) (*Laurel Heights II*). To accomplish this purpose, an EIR must contain facts *and* analysis, not just an agency’s bare conclusions. The DEIR must explain how it arrived at its conclusions. Accordingly, the revised EIR should include maps that overlay proposed development locations on sensitive habitats. Once this information is provided, it may be possible to evaluate alternative locations for certain development that would protect these sensitive communities and the species that rely on them.

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The DEIR also fails to adequately analyze impacts to the California tiger salamander (“CTS”), a federally and state protected species. As discussed above, the DEIR includes no surveys for CTS and therefore does not disclose where the populations of the species are located within the study area and where the species may breed. Even without surveys, the document acknowledges that the Project could impact 500 acres of land that is suitable as CTS habitat and 20 acres of potential CTS *breeding* habitat. DEIR at 4.4-35, 4.4-43–4.4-53 (emphasis added). The DEIR concedes the Project could lead to local *extinction* of the CTS. *Id.*

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Despite these alarming facts, the DEIR concludes, absent any evidential support, that impacts to CTS would be less than significant. To conclude as the DEIR does, that an impact is less than significant, substantial evidence must demonstrate that measures will reduce an impact to a less-than-significant level. Substantial evidence consists of “facts, a reasonable presumption predicated on fact, or expert opinion supported by fact,” not “argument, speculation, unsubstantiated opinion or narrative.” Pub. Res. Code § 21080(e)(1)-(2).

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cont.

The DEIR attempts to explain its illogical conclusion by relying on a series of vague policies located in the General Plan – none of which specifically address or even acknowledge the CTS. These vague policies cannot override the overwhelming evidence in the DEIR that development under the General Plan will significantly impact CTS. In fact, the DEIR completely ignores references in other sections of the EIR explaining that the Project will facilitate development of approximately 44 acres within a wildlife corridor that is essential for CTS. DEIR at 4.4-65. Again, the DEIR’s conclusion of insignificance is not supported by substantial evidence, and is inadequate under CEQA.

In another example, the DEIR ignores its own facts to conclude that the Project would not conflict with any plan, policy, regulation or ordinance adopted for the purpose of protecting biological resources. The DEIR explains that the United States Fish and Wildlife Service (“USFWS”) has issued a Recovery Plan for vernal pool ecosystems of California and Southern Oregon. DEIR at 4.4-32. Two areas designated as Core Recovery Areas in the Recovery Plan are located in the EIR Study Area. *Id.* at 4.4-32, 4.4-52–4.4-53. Although the Project would impact these Core Recovery Areas, and thus interfere with the overall USFWS Recovery Plan, the DEIR concludes that the Project would not conflict with any policies or ordinance. *Id.* at 4.4-67. Once again, the DEIR cites no evidence or analysis to support its conclusion.

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**3. The General Plan Policies Are Not Adequate to Reduce the Project’s Impacts to Biological Resources to a Less-than-Significant Level.**

The DEIR employs a strategy throughout the biological resources chapter of citing numerous proposed General Plan policies, followed by the assertion that they in combination with other procedures such as the Solano County habitat conservation plan (“HCP”) would collectively provide sufficient mitigation to reduce impacts to a less than significant level. There are numerous flaws with the DEIR’s approach.

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First, the HCP has yet to be adopted, and the DEIR provides no indication that it will be adopted. The CEQA Guidelines state that “mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments.” CEQA Guidelines § 15126.4(a)(2). The HCP, because it has not been adopted, clearly does not meet this standard. Even if the HCP were adopted, the DEIR never describes how the HCP would mitigate for the Vacaville General Plan’s numerous impacts to sensitive species. Therefore, the DEIR’s reliance on the HCP to mitigate impacts to sensitive species is not based on substantial evidence.

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cont.

Second, the policies in the General Plan are unlikely to reduce the Project’s impacts because of their voluntary, flexible, and unenforceable nature. Here, the proposed policies are vague and include directory terms like “as appropriate,” “where feasible” and “support,” rather than mandatory terms like “require,” “reduce,” and “deny.” Consequently because the DEIR fails to provide supporting evidence that such measures would reduce impacts to less than significant. Set forth below are a few of the most egregious examples of this legally deficient approach.

13-51

**(a) Vernal Pool Habitat and Valley Floor Grassland**

Development allowed by the proposed General Plan would directly impact approximately 1,200 acres of valley floor grassland and 42 acres of wetland habitat within the valley floor grassland and vernal pool natural community. DEIR at 4.4-52. In addition, development would indirectly impact approximately 100 acres of upland habitat and 21 acres of wetland habitat within the valley floor grassland and vernal pool natural community. *Id.*

13-52

The DEIR relies on a series of General Plan policies to fully mitigate these impacts. *Id.* at 4.4-63. The DEIR does not even identify the specific policies that would purportedly eliminate these impacts; instead it directs the reader to the “policies and actions described in Section D.1.a.i.e.” *Id.* We could find no section D.1.a.i.e in the DEIR, leaving the reader to guess which General Plan policies are intended to address the Project’s extensive impacts to valley floor grassland and wetlands. The following policies may be intended to reduce grassland and wetland impacts. As shown below, there is no evidentiary support that these policies would reduce the Project’s impacts to less than significant levels (*see commentary in italics*).

- Policy COS-P1.1 supports efforts to prepare and implement the HCP. DEIR at 4.4-54. *As the DEIR makes clear, the HCP has not been adopted and the EIR provides no assurance that it will be adopted.*

13-53

- Policy COS-P1.6 requires that new development minimize the disturbance of natural habitats and vegetation, and requires revegetation. DEIR at 4.4-54. *A policy calling for a development to “minimize” disturbance is vague and unenforceable. Minimizing impacts to habitats does not ensure sufficient protection for these habitats and the species that rely on them.*
- Policy COS-P1.9 requires that new development include provisions to protect and preserve wetland habitats. DEIR at 4.4-54. *This policy is non-specific and does not ensure that impacts would be reduced to a less than significant level.*
- Policy COS-P1.10 requires that, where avoidance of wetlands is not practicable, new development provide for off-site mitigation that results in no net loss of wetland acreage and functional value within the watersheds draining to the Delta. DEIR at 4.4-54. *A “no net loss” policy is only sufficient where there is a certainty that mitigation acreage will be of comparable quality, function, and sustainability to the area proposed to be disturbed. With respect to manufactured habitat, these requirements cannot be guaranteed. In fact, the performance record of manufactured habitat is not strong. See California Coastal Commission, Procedural Guidance for the Review of Wetland Projects in California’s Coastal Zone Ch. 2 (1994) (“CCC, Procedural Guidance”), attached hereto as Exhibit B. Accordingly, the value of mitigation habitat should be discounted to reflect the substantial likelihood that replacement habitat will not be equivalent in all respects to impacted habitat.*

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**(b) Riparian Habitats and the Sensitive Species Associated With These Habitats**

Development allowed by the proposed General Plan would directly impact approximately 33 acres of riparian, stream, and freshwater marsh habitat. DEIR at 4.4-55. An additional 20 acres of agricultural drainage ditches and other open water habitats also could be directly impacted by development activities. *Id.* at 4.4-63. The Project would also have indirect effects to riparian, stream, and freshwater marsh habitat including changes in channel morphology (e.g. down-cutting and bank erosion) from

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increased peak and base flows.<sup>1</sup> *Id.* at 4.4-55. Finally the DEIR explains that these impacts to riparian, stream, and freshwater marsh habitat could directly or indirectly affect the special-status species, including the valley elderberry longhorn beetle and western pond turtle. *Id.* at 4.4-55.

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cont.

Here too, the DEIR looks to a series of General Plan policies to fully mitigate these impacts riparian habitats and the sensitive-species that occur within these habitats. *Id.* at 4.4-63. And, again, the policies do not come close to mitigating the Project's significant effects. Policy COS-P1.3, for example, directs the protection and creation of new wildlife corridors *where feasible*. DEIR at 4.4-56. This policy is vague and directory and it is therefore impossible to evaluate its effectiveness. *See San Franciscans for Reasonable Growth v. City and County of San Francisco*, 151 Cal. App. 3d 61, 79 (1984). Moreover, this policy is essentially meaningless inasmuch as the DEIR acknowledges that development allowed by the proposed General Plan could result in the development of approximately 44 acres within the Vacaville-Fairfield Greenbelt. This wildlife corridor is critical in providing connectivity between the lowlands of the Jepson Prairie and the uplands of the Vaca Mountains. DEIR at 4.4-65.

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Other measures are entirely voluntary. *See* DEIR at 4.4-57 (citing Policy COS-P2.1: *discourages* undergrounding of creeks and *encourage* daylighting of existing culverted creeks; and Policy COS-P2.5 *encourages* restoration and expansion of riparian and floodplain habitat within channelized streams and flood channels where feasible) (emphasis added).

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In other instances, the DEIR unlawfully defers mitigation by relying on policies in the General Plan that require some future action. For instance, the General Plan calls for the City to: (1) amend the Land Use and Development Code ("LUDC") to include tree protection measures (Actions COS-A1.3, COS-A.1-7); and (2) develop a creek protection ordinance (Action COS-A2.1). DEIR 4.4-57. The conditions here do not meet the requirements necessary to defer mitigation. CEQA allows a lead agency to defer mitigation *only* when: (1) an EIR contains criteria, or performance standards, to govern future actions implementing the mitigation; (2) practical considerations preclude development of the measures at the time of initial project approval; and (3) the agency has assurances that the future mitigation will be both "feasible and efficacious." *Communities for a Better Environment v. City of Richmond*, 184 Cal. App. 4th 70, 94-95

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<sup>1</sup> The DEIR is in violation of CEQA because it does not clearly identify the acreage of indirect impacts to riparian habitats. CEQA Guidelines § 15126.2 (a).

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cont.

(2010); *San Joaquin Raptor Rescue Center*, 149 Cal. App. 4th at 669-71; CEQA Guidelines § 15126.4(a)(1)(B).

For example, the policy calling for the development of a creek ordinance is too vague to be effective. The policy contains no performance standards that will govern future actions. Nor does the DEIR provide evidence that the policies calling for LUDC amendment to protect trees would sufficiently mitigate impacts to riparian habitats and the species that rely on them. First, the City’s tree “protection” program is anything but that. As the DEIR itself admits, trees are “to some extent protected” because the LUDC “requires a permit for their removal.” *Id.* at 4.4-64. Moreover, this code section does not protect smaller trees at all. *Id.*

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cont.

Because the DEIR lacks sufficient protection for riparian habitats, it has no basis to conclude that impacts to the valley elderberry longhorn beetle, foothill Yellow-Legged Frog, and the Western Pond Turtle will be less than significant.

13-61

**(c) Swainson’s Hawk and Burrowing Owl**

The DEIR does not support its conclusions that loss of hawk and owl habitat will be less than significant. Development allowed by the proposed General Plan could impact approximately 6,844 acres of potential Swainson’s hawk and burrowing owl foraging habitat. DEIR at 4.4-58–4.4-59. It could also result in the loss of between 18 and 20 known Swainson’s hawk nest trees and the loss of at least 14 burrow sites known to support burrowing owls. *Id.* Finally, the DEIR acknowledges the potential for indirect effects on both species including, for example, from human disturbance. Again, the DEIR relies on the same ineffectual measures to conclude that impacts to these species would be less than significant.

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To mitigate impacts to the hawk and owl, the DEIR also relies on a proposed General Plan Goal COS-3 calling for supporting Solano County efforts to preserve existing agricultural lands located in the Permanent Agriculture Overlay Area and the Planning Area. DEIR at 4.4-58. As discussed above, the General Plan proposes to convert 2,640 acres of farmland of concern to non-agricultural uses. DEIR at 4.2-18. Yet only 2,793 acres of land within the EIR Study Area is farmland of concern. DEIR at 4.2-11. Therefore, although the General Plan purports to preserve agricultural lands, it, in fact, allows for the conversion of almost all land qualifying as farmland of concern.

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None of the policies within the proposed General Plan require the preservation of agricultural lands or any other habitat needed to protect the Swainson's hawk or burrowing owl. Indeed, none of the various categories of mitigation in the CEQA Guidelines' definition, CEQA Guidelines § 15370, applies. It does not "[c]ompensat[e] for the impact by replacing or providing substitute resources or environments" for the loss of habitat. *Id.* § 15370(e). Consequently, the DEIR has no basis to conclude the Project's impacts on these sensitive species would be less than significant.

13-64

**4. The DEIR Fails to Adequately Analyze and Mitigate the Project's Cumulative Effects on Biological Resources.**

Poorly planned development has resulted in the loss of valuable habitat and has placed a large number of endangered species and entire ecosystems at risk of extirpation. *See* Ecological Support For Rural Land-Use Planning, Theobald et al., attached as Exhibit C . Because of the fundamental importance of the City's lands in maintaining the region's biodiversity, the DEIR should have carefully analyzed the cumulative impacts of this loss of habitat together with other habitat loss in the County and the northern California region. The need for such analysis is compelling given that conservation scientists are particularly concerned about the changes in native landscapes, habitat fragmentation, disruption of landscape linkages and wildlife corridors, and biodiversity as a consequence of development and other forms of resource use. *Id.*

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Incredibly, the EIR simply identifies the acreage of potential cumulative development but never evaluates what effect this loss of acreage will have on sensitive species. The failure to conduct *any* cumulative impacts analysis is especially disconcerting given that this is a program-level EIR that should appropriately focus on cumulative impacts. *See* CEQA Guidelines § 15168(b)(4) (consideration of broad policy alternatives and program mitigation measures at this early stage when agency has greater flexibility to deal with cumulative impacts).

Notwithstanding the failure to conduct a thorough cumulative impact analysis, the DEIR relies on the City's participation in the Solano HCP for mitigation of the Project's contribution to these impacts. *Id.* As discussed above, however, the DEIR provides no assurance the HCP will be adopted. Consequently, the DEIR may not rely on the HCP as adequate mitigation.

13-66

**C. The DEIR’s Analysis of and Mitigation for the General Plan’s Transportation Impacts Is Factually and Legally Deficient.**

**1. The DEIR Contains No Evidence that Its Transportation Model Actually Reflects Buildout Conditions Under the General Plan.**

Rather than use a land use-based approach to transportation impact analysis, the DEIR relies on a Citywide travel demand forecast model to develop its trip generation and vehicle miles traveled projections. DEIR at 4.14-38, 39. Because the assumptions employed in the use of this model are not presented in the DEIR, it is not possible to determine if the traffic model uses the same population and employment assumptions as the draft General Plan itself or if and how it considers the General Plan’s land use designations. In other words, there is no evidence that the transportation model is actually analyzing the impacts of the General Plan rather than some other scenario.

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**2. The DEIR Improperly Evaluate the Project’s Transportation Impacts Against the 1990 General Plan.**

The DEIR fails to evaluate the General Plan’s transportation impacts against an accurate baseline. As the MRO Engineers Report explains, the DEIR compares the number of trips associated with the proposed General Plan to the 1990 General Plan rather than to existing conditions. Specifically, the DEIR states that the number of trips due to the proposed General Plan would be “within 1 percent of the 2035 trips generated with the 1990 General Plan.” DEIR at 4.14-37.

Comparing environmental impacts to a plan, rather than existing conditions is inconsistent with CEQA case law. In *Communities for a Better Environment v. South Coast Air Quality Management District*, 158 Cal. App. 4th 1336, 1353 (2007), the court held that it is improper to use “the level of emissions that [the applicant] is allowed to emit under existing permits as the baseline” because the applicant had not emitted at the level permitted in the past. Using the “permit’s maximum figure as the baseline for [the project], ... improperly calculated the baseline environmental setting on the basis of ‘merely hypothetical conditions’ as opposed to ‘realized physical conditions on the ground.’” *Id.* (citing *San Joaquin Raptor Rescue Center*, 149 Cal. App. 4th at 658). The court “conclude[d] that a project’s baseline is normally comprised of the existing environmental setting—not what is hypothetically allowed pursuant to existing zoning or permitted plans.” *Id.* at 1361.

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Similarly, in *Woodward Park Homeowners Assn., Inc. v. City of Fresno*, 150 Cal. App. 4th 683, 708 (2007), the court held that when evaluating the impact of developing a parcel, the lead agency could not use the maximum development allowed under existing zoning as the baseline. Rather, the baseline was what was actually on the ground, a vacant lot. The court explained that without the proper baseline, “the EIR never presented a clear or a complete description of the project’s impacts compared with the effects of leaving the land in its existing state.” *Id.*

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cont.

Here, the General Plan has the potential to result in a significant increase in traffic impacts compared to existing conditions. Indeed, DEIR Table 4.14-8 reveals that the General Plan would increase the number of daily trips in Vacaville by 48 percent and the number of peak-hour trips will increase by 47-50 percent, which is obviously substantially greater than the one percent value assumed in the DEIR.

### **3. The DEIR Underestimates the Project’s Transportation Impacts Because It Relies on a Questionable Future Roadway Network.**

The DEIR errs further because it evaluates the General Plan’s transportation impacts against a future baseline. DEIR at 4.14-36. The DEIR assumes that several roadways will be in place by 2035, yet the DEIR lacks evidence showing that these projects will actually be constructed by this date. CEQA case law holds that existing conditions at the time an agency prepares environmental review, rather than some hypothetical future scenario, establish the “baseline” for determining the significance of impacts. *See* CEQA Guidelines § 15125(a); *see also* *Communities for a Better Env’t. v. S. Coast Air Quality Mgmt. Dist.*, 48 Cal. 4th 310, 322 (2010); *Save Our Peninsula Cmte. v. Monterey County Board of Supervisors*, 87 Cal. App. 4th 99, 125 (2001); *Environmental Planning & Information Council v. County of El Dorado*, 131 Cal. App. 3d 350, 354 (1982).

13-69

If these roadway projects are not in place in 2035 as the DEIR assumes, the Plan’s traffic impacts will be considerably more severe than disclosed in the DEIR. Indeed certain projects would appear to be outside the City’s jurisdiction. The Vaca Valley Road/Interstate 505 Interchange and Overcrossing Widening California Drive Extension and Interstate 80 Overcrossing Construction, in particular, would likely be constructed by Caltrans. As such, the City has even less certainty and assurance that the roadway improvements will be in place by 2035.

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In order to understand exactly how the City’s roadways would operate upon implementation of the General Plan, the revised EIR must conduct two separate analyses.

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First, it should evaluate the traffic that would be generated by General Plan buildout against existing conditions (i.e., the 2013 roadway network). Second, the EIR should evaluate the traffic that would be generated by General Plan buildout against a 2035 roadway system. Yet, in regards to this latter analysis, only those transportation improvement projects that have a high likelihood for full implementation by 2035 — i.e. those that are programmed and have a high likelihood of funding — should be included in the transportation model in order to provide a realistic evaluation of future traffic impacts.

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cont.

**4. The DEIR Fails to Include Feasible Mitigation Measures for the General Plan’s Transportation Impacts.**

The DEIR relies on mitigation measures of questionable feasibility and therefore lacks sufficient evidentiary basis to conclude the Project’s transportation impacts would be reduced to a less-than-significant level. The DEIR states:

If a mitigation measure is included in the proposed General Plan Transportation Element, it is considered to be part of the proposed project and is assumed to be able to be implemented as a mitigation measure. For these mitigation measures, implementation is assumed regardless of funding status, and the impact after mitigation is considered to be less than significant. DEIR at 4.14-40.

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The DEIR cannot assume that a mitigation measure is feasible and implementable simply because it is included in the DEIR. One of the basic principles of environmental analysis is that until there is a reasonable level of certainty that a particular mitigation measure can, in fact, be implemented, no mitigation exists. MRO Engineer Report at 7. Transportation system improvements without a designated funding source remain speculative, and without any meaningful indication of the availability of adequate funding for the necessary transportation system improvements, it is impossible to state with certainty that the improvements are feasible. Thus, it is inappropriate to conclude that the associated impacts will be reduced to less than significant.

Finally, the DEIR must evaluate the potential environmental effects of each of the proposed mitigation measures. CEQA Guidelines § 15126.4 (a)(1)(D). The DEIR fails to conduct such an analysis.

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**D. The DEIR Fails to Adequately Analyze and Mitigate the General Plan’s Air Qualities Impacts.**

The City of Vacaville, and the surrounding Sacramento Valley Air District, suffers from poor air quality. It is nonattainment for the state and national ozone standards, nonattainment for the state PM<sub>10</sub> standard, and partial nonattainment for the federal PM<sub>2.5</sub> standards. DEIR at 4.3-10. It is imperative that the DEIR provide an accurate assessment of the Plan’s potential to further degrade air quality. Unfortunately, the air quality analysis does not comply with CEQA.

13-74

**1. Criteria Air Pollutant Emissions**

There are numerous flaws in the DEIR’s criteria air pollutant analysis. First, like the transportation analysis discussed above, criteria pollutant analysis, relies on the Citywide Travel Demand Model. Because the DEIR omits any explanation of the model’s assumptions, it is impossible to determine whether the emissions’ estimates accurately reflect the General Plan. The DEIR simply identifies the Project’s increase in ROG, NO<sub>x</sub> and PM<sub>10</sub> without explaining how these estimates were determined. Meaningful analysis of impacts effectuates one of CEQA’s fundamental purposes: to “inform the public and responsible officials of the environmental consequences of their decisions before they are made.” *Laurel Heights II*, 6 Cal. 4th at 1123. To accomplish this purpose, an EIR must contain facts *and* analysis, not just an agency’s bare conclusions. *Citizens of Goleta Valley v. Board of Supervisors*, 52 Cal. 3d 553, 568 (1990).

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Second, the DEIR’s conclusions regarding projected vehicular emissions levels are further undermined by an assumed reduction in per-car tailpipe emissions, sufficient to overcome the increased driving due to population growth. DEIR at 4.3-20. Although vehicles are getting cleaner, the DEIR’s conclusion that overall ROG and NO<sub>x</sub> vehicular emissions will decrease by 2035 is wholly insupportable in the absence of evidence regarding land use patterns. Studies show that growth in driving is likely to cancel out improved vehicle fuel economy:

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If sprawling development continues to fuel growth in driving, the projected increase in the total miles driven between 2005 and 2030 will overwhelm expected gains from vehicle efficiency and low-carbon fuels. Even if the most stringent fuel-efficiency proposals under consideration are enacted, [ ] “vehicle emissions still would be 34 percent above 1990 levels in 2030 –

entirely off-track from reductions of 60-80 percent below 1990 levels by 2050 required for climate protection.”

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cont.

See “Growing Cooler: Evidence on Urban Development Change,” Executive Summary, attached as Exhibit D.

If future growth occurs in a pattern that encourages more driving than the Citywide Travel Model assumes, then the DEIR’s conclusions are entirely wrong. Without information about the correlation between the transportation model and the development patterns under the General Plan, one cannot assess whether the reduction in vehicular emissions will indeed compensate for the increased in vehicle miles travelled (“VMT”). Thus the DEIR is not supported by the substantial evidence that CEQA requires.

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Third, the DEIR does not analyze the Project’s emissions of ROG, NO<sub>x</sub> and PM<sub>10</sub> against a baseline of existing conditions. Instead it compares emissions in 2035 against two improper baselines: (1) emissions assumed under the existing General Plan, and (2) emissions assumed under hypothetical conditions in 2035. See DEIR Table 4.3-4 at 4.3-20. As discussed above, comparing environmental impacts to a plan, rather than existing conditions is inconsistent with CEQA case law. *Communities for a Better Environment*, 158 Cal. App. 4th at 1353. Thus, the DEIR’s comparison of emissions under the proposed General Plan to emissions assumed under the 2008 General Plan is improper. The EIR must be revised to evaluate the Plan’s impacts against a baseline of existing conditions.

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The DEIR further errs because it compares the Project’s ROG, NO<sub>x</sub> and PM<sub>10</sub> emissions to hypothetical future conditions in 2035, instead of to existing conditions. DEIR at 4.3-20. Thus, the DEIR incorrectly concludes the Plan’s ROG and NO<sub>x</sub> emissions would be reduced under the proposed General Plan scenario due to more stringent tailpipe controls that would be implemented by the year 2035. As discussed above, studies show that growth in driving is likely to cancel out improved vehicle fuel economy. If the DEIR had used a proper baseline, the EIR would have disclosed that the Project will likely cause a significant increase in ROG and NO<sub>x</sub> emissions, and the EIR would be required to adopt all feasible mitigation measures.

13-79

Fourth, the DEIR provides *no* analysis of PM<sub>2.5</sub> in its criteria pollutant analysis.<sup>2</sup> Such an analysis is necessary inasmuch as the region is considered partial nonattainment for the federal PM<sub>2.5</sub> standards. DEIR at 4.3-10. PM<sub>2.5</sub> is generated by both vehicles and wood-burning fireplaces, among other sources. DEIR at 4.3-14; General Plan COS-30. An analysis of the Plan’s increase in PM<sub>2.5</sub> emissions is critical since PM<sub>2.5</sub> can result in public health impacts. PM<sub>2.5</sub> particles are so small that they can evade the body’s natural defense mechanisms and penetrate deep into lung tissue. *See* PM<sub>2.5</sub> Designations Under the Clean Air Act, U.S. Environmental Protection Agency, attached as Exhibit E.

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## 2. Violation of the Applicable Air Quality Plan

The DEIR concludes the Project would not conflict with or obstruct implementation of the applicable air quality plan. There are several applicable air quality plans relevant to the proposed Project. These include the Sacramento Regional 8-Hour Ozone Attainment Draft Report (“Ozone Plan”), the 2006 and 2009 Triennial Assessment and Plan Update (“Triennial Plan”), and the Sacramento Association of Government’s Metropolitan Transportation Plan (“MTP”). DEIR at 4.3-18.

The DEIR explains that the forecasts for these air quality plans rely on projections of VMT, populations, and employment, which are based on land use projections made by local general plans. *Id.* The population and employment data assumptions are based on Vacaville’s current General Plan. The proposed General Plan would not increase the 2035 population or employment forecast. *Id.* The DEIR then asserts that total VMT with implementation of the proposed General Plan would slightly increase beyond the level predicted for the current General Plan in 2035; however, this increase would not generate substantial emissions that would result in a violation of air quality standards. *Id.* We can find no evidence in the record to support this assumption. In fact, documentation in the DEIR itself refutes the assumption that VMT would increase only slightly. VMT is projected to increase by at least 63 percent. DEIR at 4.14-38.

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In addition, the DEIR provides no evidence to support the conclusion that total VMT under the proposed Plan would “not generate substantial emissions.” CEQA requires the information regarding the project’s impacts must be “painstakingly ferreted out.” *Environmental Planning and Information Council of Western El Dorado County v.*

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<sup>2</sup> The DEIR does consider PM<sub>2.5</sub> in the analysis of construction-related impacts. While important, this construction-related analysis cannot substitute for the Plan’s operational PM<sub>2.5</sub> emissions.

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cont.

*County of El Dorado*, 131 Cal. App. 3d 350, 357 (1982). The DEIR does not meet this standard.

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cont.

**3. The DEIR Fails to Adequately Analyze or Mitigate the Plan's Cumulative Air Quality Impacts.**

The DEIR's analysis of cumulative impacts is incomplete, cursory and superficial. Initially, the analysis does not comply with CEQA's requirement that agencies first determine whether cumulative impacts to a resource are significant, and then to determine whether a project's impacts are cumulatively considerable (i.e., significant when considered in conjunction with other past, present and reasonably foreseeable projects). CEQA Guidelines § 15064(h)(1). The DEIR skips the first step and focuses only on the second. This error causes the document to underestimate the significance of the Project's cumulative impacts because it focused on the significance of the Project's impacts on their own as opposed to considering them in the context of the cumulative problem. It is wholly inappropriate to end a cumulative analysis on account of a determination that a project's individual contribution would be less than significant. Rather, this should constitute the beginning of the analysis. Even where a project might cause an "individually limited" or "individually minor" incremental impact that, by itself, is not significant, the project may nevertheless contribute to a cumulative impact if the contribution is "cumulatively considerable" when viewed together with environmental changes anticipated from past, present, and probable future projects. CEQA Guidelines §§ 15064(h)(1), 15355(b).

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Here, the DEIR fails even to analyze the General Plan's effects together with the effects of past, present, and future development projects. Instead, it simply concludes that because the Project would be consistent with the applicable air quality plans, the Project's cumulative impacts would be less than significant. Even if this analysis were sufficient, the DEIR lacks the evidentiary support to conclude that the Plan-specific impacts would be less than significant, as explained above.

The EIR must be revised to include a proper Plan-specific and cumulative air quality analysis. In regards to the cumulative analysis, the EIR preparers must examine the combined effects of both the proposed Plan and the other identified projects. There are two parts to this question: (a) is there a significant impact to the environment that (b) is the result of the effects of the Plan combined with the effects of other projects? If the Plan contributes to the cumulative impact, the EIR must identify mitigation for this contribution.

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**E. The DEIR Fails to Adequately Analyze and Mitigate for the General Plan’s Greenhouse Gas Emissions.**

**1. The DEIR May Not Identify Compliance with the ECAS as a Standard of Significance Because the ECAS Is Itself Part of the Project.**

The DEIR establishes the Project’s compliance “with a qualified GHG emissions reduction strategy” as a standard of significance for greenhouse gas (“GHG”) emissions’ impacts. DEIR at 4.7-22–4.7-23. The DEIR determines that the ECAS is a qualified GHG emissions reduction strategy. DEIR at 4.7-23. Thus, it evaluates whether the General Plan complies with the ECAS in order to determine whether the Project will result in a significant impact in regards to GHG emissions. *Id.*

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In order to be a “qualified emissions reduction strategy,” the ECAS must have undergone environmental review. DEIR at 4.7-23 (listing requirements established by the Bay Area Air Quality Management District guidance). The ECAS has not undergone environmental review. In fact, the Project that the DEIR is evaluating comprises the ECAS, along with the General Plan. DEIR at 3-1. Therefore, the ECAS is *not* a qualified emissions reduction, and this standard of significance is not applicable to this DEIR. The City must identify a standard of significance that is applicable to evaluate the Project and that is supported by substantial evidence.

**2. The DEIR Wholly Fails to Analyze and Mitigate the Impacts from the Project’s Noncompliance with EO S-03-05.**

The DEIR concludes that the Project’s impacts from GHG emissions are significant because the Project conflicts with the goal of Executive Order S-03-05 to reduce GHG emissions by 80% below 1990 levels by 2050. DEIR at 4.7-27. Yet the DEIR fails to actually disclose the extent of the impact, as required by CEQA.

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An agency’s rote acknowledgement that impacts are “significant” does not cure an EIR’s failure to analyze the issue. As the court stated in *Galante Vineyards v. Monterey Peninsula Water Management Dist.*, 60 Cal. App. 4th 1109 (1997), “this acknowledgment is inadequate. ‘An EIR should be prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences . . . .’” *Id.* at 1123 (quoting *Santiago County Water Dist. v. County of Orange*, 118 Cal. App. 3d 818, 831 (1981)); *see also Mira Monte Homeowners Assn. v. County of Ventura*, 165 Cal.

App. 3d 357, 365 (1985) (an EIR is meant to protect “the right of the public to be informed in such a way that it can intelligently weigh the environmental consequences of a[] contemplated action.”). Thus, an agency may not, as the City attempts to do here, “travel the legally impermissible easy road to CEQA compliance . . . [by] simply labeling the effect ‘significant’ without accompanying analysis . . .” *Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners*, 91 Cal. App. 4th 1344 1371, 2001.

This is precisely what the DEIR does in regard to its conclusion that the Project’s noncompliance with Executive Order S-03-05 is a significant impact. The DEIR calculates the GHG emissions in 2035 under the proposed General Plan. DEIR at 4.7-27. However, it fails to identify the level the GHG emissions need to be in 2035 to be on track to meet the 2050 goal set by the executive order. Thus, the EIR fails to disclose to what extent the GHG emissions under the General Plan will fail to meet the target emissions. According, under CEQA, “a more detailed analysis of how adverse the impact will be is required.” *Galante Vineyards*, 60 Cal. App. 4th at 1123.

The DEIR further fails to meet the requirements of CEQA because it fails to identify any mitigation measures to lessen the Project’s noncompliance with Executive Order S-03-05. Instead, the DEIR summarily concludes that “all feasible measures are included in the proposed ECAS. No additional mitigation is available, and the impact is considered significant and unavoidable.” DEIR at 4.7-28. To the contrary, the most effective mitigation measure for most of the General Plan’s impacts, including climate impacts, is to modify the land use diagram and land use designations to discourage sprawl, to increase the density of residential uses, and to increase mixed-use residential and commercial areas that are designed to be walkable and to be near mass transit systems. *See CAPCOA, CEQA and Climate Change* (Jan. 2008), excerpts attached as Exhibit F, at 69; Air Resources Board, Economic and Technology Advisory Committee, *Technologies and Policies to Consider for Reducing Greenhouse Gas Emissions in California* (2008), excerpts attached as Exhibit G, at 3-12–3-15.

The ECAS recognizes that unsustainable growth has created conditions in Vacaville where “driving is often the only viable mode of transportation.” ECAS at 1-12. Specifically, “auto-oriented designs . . . have made non-automotive transportation mode more difficult and less appealing to use.” *Id.* Because of this historic growth pattern, it is no surprise that the vast majority of GHG emissions currently produced in Vacaville (63%) come from transportation sources. DEIR at Table 4.7-4.

The General Plan as proposed continues this pattern of unsustainable growth. The amount of VMT under the General Plan is expected to increase by 63% by 2035. DEIR

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at 4.14-38. Thus, the General Plan will result in significant increases in VMT, despite the fact that vehicles are the greatest source of GHG emissions in Vacaville. Although the ECAS includes measures to mitigate GHG emissions, including measures that will reduce VMT, the ECAS does nothing to modify the land use diagram proposed by the General Plan, which will continue the pattern of auto-oriented design.

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Recognizing the unsustainable growth in driving, the American Association of State Highway and Transportation Officials, which represents state departments of transportation, is urging that the growth of VMT *be cut in half*. See “Growing Cooler: Evidence on Urban Development and Climate Change,” Urban Land Institute, attached as Exhibit D. Slowing the growth of VMT, especially when many jurisdictions including Vacaville are facing substantial increases in population, is a daunting task. However, much of the rise in vehicle emissions can be curbed simply by managing land use in a way that makes it easier for people to drive less. *Id.* The Legislature and the people of California have decided that this state must move toward sustainable growth. The City must take a far more aggressive role in working toward this goal. Consequently, as discussed below, the DEIR must identify mitigation measures or Plan alternatives that promote sustainable growth as a mechanism for reducing VMT.

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**3. The DEIR Fails to Analyze the Impacts of GHG Emissions that Will Occur Under Full Buildout.**

As described previously, the DEIR’s use of two development scenarios is inappropriate and misleading, particularly because the DEIR fails to provide a full analysis of the impacts occurring under the full buildout, i.e., the General Plan. The climate impact analysis provides a particularly egregious example of this flaw in the document. *The DEIR supplies no estimate of GHG emissions under the full buildout scenario.* The DEIR does not provide any explanation for why emissions could be modeled for the Horizon-Year Projection but not for the General Plan as proposed. Rather, the DEIR simply states that “the potential for impacts related to GHG emissions would increase” under the full buildout scenario. DEIR at 4.7-28. Without this analysis, the DEIR fails to evaluate the impacts of the General Plan as proposed, in flagrant violation of CEQA.

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**4. The DEIR and ECAS Fail to Include Mitigation Measures for GHG Emissions that Are Sufficiently Enforceable.**

The DEIR fails to meet the requirements of CEQA because the mitigation measures proposed in the ECAS are not sufficiently enforceable. Mitigation measures

13-91

proposed in an EIR must be “fully enforceable” through permit conditions, agreements, or other legally binding instruments. Pub. Res. Code § 21081.6(b); CEQA Guidelines § 15126.4(a)(2). Further, in order to qualify as a GHG emissions reduction strategy, the plan must demonstrate “target achievement” and mitigation measures must be “mostly mandatory.” DEIR at 4.7-23. The measures included in the ECAS fail to meet these standards.

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The following mitigation measures should be revised so that they are sufficiently mandatory:

- LU-8: Discourage density reductions on infill sites within ¼-mile of retail and employment centers and transit routes. ECAS at 5-9. *This measure should be revised to “prohibit density reductions unless applicant makes written findings demonstrating financial or technical infeasibility.”*
- TR-10: Develop a pedestrian plan and implement network improvements, especially where needed to fill in gaps in the existing network. Include baseline data with goals to increase the percent of walking for transportation purposes. ECAS at 5-10. *This measure could be strengthened by committing to double the City’s existing pedestrian and bicycle mode share for workers by 2020.*
- TR-3: Revisit off-street parking ordinances to encourage shared parking and parking maximums. Reduce required parking as an incentive for infill development and the installation of bikeways and bicycle parking. ECAS at 5-10. *This measure should be revised to require the City to adopt a comprehensive parking management ordinance that would include measures selected from “Driving Urban Environments: Smart Growth Parking Best Practices,” Governor’s Office of Smart Growth, Maryland, attached as Exhibit H. These measures include:*
  - *reduced minimum parking requirements*
  - *parking maximums and area-wide parking caps*
  - *fees-in-lieu as an alternative to requiring on-site parking facilities*
  - *shared parking*
  - *unbundling parking*

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- *pricing strategies*
- *parking management districts*

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The DEIR should also further analyze the feasibility of the following measures to reduce the General Plan’s significant climate change impacts:

1. Transportation Management Plan

The City should adopt a Transportation Management Plan (“TMP”) culminating in “Implementing Mechanisms” to ensure that the City is taking all available means to ensure the success of alternative modes of transportation. The TMP could be modeled on Portland’s Central City Transportation Management Plan (“CCTMP”), attached as Exhibit I, which would include the following components:

- a. Commit to reducing vehicle miles traveled over 2013 levels.
- b. Develop a traffic monitoring plan (e.g., at five year intervals, commencing upon adoption of the General Plan, the City shall conduct a city-wide evaluation of the ability of the arterial and freeway system to accommodate traffic).
- c. Commit to increasing the City’s existing transit mode share for workers by twenty percent and overall transit mode share by ten percent by 2035.
- d. Commit to a detailed study which shall culminate in a series of Strategies and Implementation Actions addressing the following:
  - i. Creation of a transit “fareless square” within the City’s employment and retail core to expand the use of transit in the off-peak hours for non-commute trips.
  - ii. Study the feasibility of enacting an ordinance to collect an alternative transportation impact fee for transit and streetscape improvements.
  - iii. Prepare a plan for enhancing streetscapes along transit corridors and redesigning bus stops so that they are attractive, welcoming, comfortable and user friendly.

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- iv. Implementation of downtown shuttle service (with private sector financial contributions).

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2. Reduce Vehicular Demand

The City should develop strategies to reduce vehicle demand on City roadways. Land development projects shall be required to contribute toward transit, bike and pedestrian improvements before consideration is given to highway or intersection capacity expansion.

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3. Project Review by Regional Planning and Transit Agencies

When an application is filed for any development project, the City should promptly provide the Council of Governments, applicable transit districts, and transit providers with a copy of the plans and specifications, and shall request that these agencies recommend changes or conditions that can achieve one or more of the following objectives:

- a. Reduce automobile use, especially single occupant vehicle automobile trips;
- b. Encourage and support the use of transit;
- c. Encourage the use of bicycles and walking as an alternative mode of transportation.

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Recommendations from the agencies should be incorporated into the project, and shall be made conditions of project approval, unless, based upon substantial evidence, the City determines that the recommendations would be ineffective in achieving one or more of the above objectives, or that the benefits provided by imposing the requirement would be disproportionately small, compared to the cost or difficulty of implementing or carrying out the requirement.

4. Programs for Smart Growth/Transit-Oriented Development

To facilitate development of transit-oriented development (“TOD”) projects, the City should directly facilitate “smart growth” or TOD programs and funding. The City should award funds for transportation projects to local jurisdictions that approve building permits for compact housing and mixed use development near transit. When possible,

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the City should also provide its own incentives, including fast track project approval, and fee waivers to encourage such “smart growth” and TOD projects

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cont.

#### IV. The EIR Should Be Recirculated

CEQA requires recirculation of an EIR when significant new information is added to the document after notice and opportunity for public review was provided. CEQA § 21092.1; CEQA Guidelines § 15088.5. “Significant new information” includes: (1) information showing a new, substantial environmental impact resulting either from the project or from a mitigation measure; (2) information showing a substantial increase in the severity of an environmental impact not mitigated to a level of insignificance; (3) information showing a feasible alternative or mitigation measure that clearly would lessen the environmental impacts of a project and the project proponent declines to adopt the mitigation measure; or (4) instances where the draft EIR was so fundamentally and basically inadequate and conclusory in nature that public comment on the draft EIR was essentially meaningless. CEQA Guidelines § 15088.5(a); *Laurel Heights II*, 6 Cal. 4th at 1130

13-99

As this letter explains, the General Plan DEIR clearly requires extensive new information and analysis. This analysis will likely result in the identification of new, substantial environmental impacts or substantial increases in the severity of significant environmental impacts. Moreover, the flaws that permeate the entire document, particularly the DEIR’s use of the Horizon-Year Projection (*see* Section II), constitute precisely the sort of pervasive flaws in the document that independently require recirculation under Guidelines section 15088.5(a)(4). *See Mountain Lion Coalition v. Fish & Game Comm’n*, 214 Cal. App. 3d 1043, 1052-53 (1989). Consequently, the City must revise and recirculate the EIR for public review and comment.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP



Laurel L. Impett, AICP, Urban Planner  
Erica Maharg

**Exhibits:**

- Exhibit A: MRO Engineers Report
- Exhibit B: Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone Ch. 2, California Coastal Commission.
- Exhibit C: Ecological Support For Rural Land-Use Planning, Theobald et. al.
- Exhibit D: Growing Cooler: The Evidence on Urban Development Change, Urban Land Institute.
- Exhibit E: PM<sub>2.5</sub> Designations Under the Clean Air Act, U.S. Environmental Protection Agency.
- Exhibit F: CEQA and Climate Change, Jan. 2008, CAPCOA.
- Exhibit G: Technologies and Policies to Consider for Reducing Greenhouse Gas Emissions in California, 2008, Air Resources Board, Economic and Technology Advisory Committee.
- Exhibit H: Driving Urban Environments: Smart Growth Parking Best Practices," Governor's Office of Smart Growth, Maryland.
- Exhibit I: Portland's Central City Transportation Management Plan.

cc: Ellen Fawl, Solano Orderly Growth Committee  
Ernest Kimme, Solano Orderly Growth Committee

**13-100**

LLI:JM

# Exhibit A

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EXHIBIT

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# Exhibit A

13-100  
cont.



December 10, 2013

Ms. Laurel L. Impett, AICP  
Shute, Mihaly & Weinberger LLP  
396 Hayes Street  
San Francisco, California 94102

Subject: Review of Traffic and Transportation Analysis –  
*City of Vacaville General Plan and Energy and Conservation Action Strategy Draft EIR*

Dear Ms. Impett:

As requested, MRO Engineers, Inc., has completed a review of the “Traffic and Transportation” analysis completed with respect to the proposed City of Vacaville General Plan Update. The proposed project is the subject of a Draft Environmental Impact Report (DEIR), which was prepared by The Planning Center/DC&E in October 2013. The DEIR incorporates a traffic and transportation impact analysis prepared by Kittelson & Associates, Inc.

13-101

Before presenting the results of our detailed review of the “Traffic and Transportation” analysis, we would like to point out a potentially misleading statement in the DEIR Report Summary. Specifically, DEIR p. 2-3 includes the following statement:

*... the proposed General Plan and ECAS have been developed to be largely self-mitigating, and as a result, there are few impacts that would occur solely on the basis of implementation of the proposed project.*

13-102

In contrast to this statement, we would note that the “Traffic and Transportation” section of the DEIR identifies a total of 38 significant impacts. Of that total, 19 (i.e., 50 percent) will remain significant and unavoidable. It is clear, therefore, that the traffic circulation component of the proposed plan falls far short of being “self-mitigating.” Instead, implementation of the proposed General Plan Update will substantially reduce the quality of life of Vacaville residents, as they will find it increasingly difficult to travel about the city.

**TRAFFIC AND TRANSPORTATION ANALYSIS REVIEW**

Our review of the “Traffic and Transportation” analysis prepared for the proposed Vacaville General Plan Update revealed several issues that must be addressed prior to approval by the City of Vacaville of the environmental documentation. These issues are presented below.

- 1. **Level of Service Standard for Caltrans Facilities** – Two major roadways in Vacaville are under Caltrans’ jurisdiction: Interstate 80 (I-80) and Interstate 505 (I-505). Page 4.14-3 of the DEIR states that:

13-103

*Caltrans maintains a minimum level of service (LOS) at the transition between LOS C and LOS D for all of its facilities. Where an existing facility is operating at less than the LOS C/D threshold, the existing measure of effectiveness should be maintained.*



In other words, Caltrans considers LOS C to be acceptable and LOS D to be unacceptable. This standard is presented in the *Guide for the Preparation of Traffic Impact Studies* (Caltrans, 2002). Moreover, in their response to the Notice of Preparation for the General Plan Update DEIR, Caltrans specifically stated that this threshold “should be applied to all state facilities.” (Ref.: Letter to Tyra Hays, City of Vacaville, from Lisa Carboni, Caltrans District Branch Chief, Local Development – Intergovernmental Review, February 23, 2011.)

However, the impact analysis employs a much more lenient set of significance criteria. DEIR page 4.14-34 presents the following standards of significance:

- Cause Interstate 80 between Post Mile 23.03 and 24.08 (segment between Pena Adobe Road and Alamo Drive) to degrade below LOS E.
- Cause Interstate 80 between Post Mile 28.359 and 32.691 (segment between Interstate 505 interchange and Leisure Town Road) to degrade below LOS F.

These criteria raise several issues:

- They conflict with the stated operational standard established by Caltrans, the agency that owns and controls these roadways.
- No standard is presented with respect to I-505, so it is impossible to determine whether the proposed General Plan Update would result in a significant impact on that facility.
- No standard is presented with respect to the following segments of I-80:
  - Between the southwesterly city limit and Pena Adobe Road,
  - Between Alamo Drive and I-505, and
  - Between Leisure Town Road and the northeasterly corner of the study area.
- The second significance standard presented above indicates that a significant impact would result if the pertinent segment of I-80 were “to degrade below LOS F.” Because LOS F is the lowest operational level, it is impossible to degrade below that level of service (i.e., there is no LOS G). Thus, it would be impossible to ever have a significant impact on that freeway segment.
- There is no correlation between the DEIR level of service standards and the freeway segments analyzed. Specifically, the three freeway segments addressed by the analysis are as follows:
  - I-80 west of Lagoon Valley Road,
  - I-80 east of Leisure Town Road, and
  - I-505 north of I-80.

None of these three segments fall within the boundaries of the standards of significance presented above and on DEIR p. 4.14-34. That is, none of the segments analyzed are on I-80 between Pena Adobe Road and Alamo Drive or between the Interstate 505 interchange and Leisure Town Road. Given this, it is impossible to evaluate whether the proposed General Plan Update would have a significant impact on the I-80 and I-505 freeways within the study area.

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- Application of the Caltrans standard presented above (i.e., the threshold between LOS C and LOS D) to the freeway segments analyzed would result in the following significant impacts, based on information presented in DEIR Table 43.14-12 (DEIR p. 4.14-71):
  - I-80 west of Lagoon Valley Road
    - Eastbound: PM peak hour – LOS F
    - Westbound: AM peak hour – LOS D and PM peak hour – LOS E
  - I-80 east of Leisure Town Road
    - Eastbound: PM peak hour – LOS F
    - Westbound: AM peak hour – LOS D

The westbound impacts listed here were not included in the DEIR.

Clearly, the analysis of the Caltrans-controlled freeway segments within the study area is deficient. Although the DEIR identifies two freeway segments as having significant impacts (the eastbound segments of I-80 west of Lagoon Valley Road and east of Leisure Town Road), it is not clear how this conclusion was derived, since no significance criteria were stated with respect to those areas.

Moreover, the DEIR analysis only evaluates I-80 freeway operations at the extreme southwest and northeast corners of the City. It completely ignores the segments of I-80 between Lagoon Valley Road and Leisure Town Road, which represent the bulk of the I-80 freeway within Vacaville.

The freeway segment analysis must be revised to reflect application of the Caltrans operational standard to I-80 and I-505 throughout the study area, as well as to incorporate analyses of the segments of I-80 between Lagoon Valley Road and Leisure Town Road. The revised DEIR will then need to be recirculated for further public review.

2. **Travel Demand Forecasting Model** – DEIR p. 4.14-6 describes the role of the Solano Transportation Authority (STA) as the local Congestion Management Agency, including that agency’s responsibilities relative to maintaining the Napa-Solano Travel Demand Model. The DEIR states that:

*Traffic volume forecasts from the Solano/Napa Model are used to analyze regional transportation projects. The Solano/Napa Model maintains consistency with the population, housing, and employment projections developed by ABAG [Association of Bay Area Governments].*

In their NOP comment letter dated March 17, 2011, STA stated that the City, “. . . should use the Napa-Solano Travel Demand Model to analyze project impacts on the Routes of Regional Significance that will be impacted by the project . . .” However, DEIR p. 4.14-36 says that the DEIR traffic analysis used the Vacaville Citywide Traffic Model instead of the Napa-Solano Travel Demand Model.

The use of this locally-based model, rather than the regional model maintained by STA, must be explained and justified so as to ensure that the analysis accurately reflects future conditions in and around Vacaville and, further, that the impacts of the proposed General Plan Update are fully revealed.

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3. **Intersection Level of Service Analysis Methodology** – DEIR pages 4.14-7 and 4.14-8 describe the recent decision by the City of Vacaville to abandon the long-obsolete Circular 212 intersection level of service analysis methodology, and to adopt the *Highway Capacity Manual* in its place. On March 26, 2013, the Vacaville City Council unanimously adopted resolution 2013-023, which established the *Highway Capacity Manual* as the standard for “transportation congestion analyses.”

The *Highway Capacity Manual* is a publication of the Transportation Research Board (TRB), one of the entities within the National Academy of Sciences. The current (fifth) edition of the HCM was published in the year 2010. It follows previous editions completed in 1965, 1985, 1997, and 2000.

The year 2010 version of the *Highway Capacity Manual* (HCM 2010) was released on April 11, 2011, almost two years prior to its adoption by the City of Vacaville. Despite this, the intersection level of service calculations presented in DEIR Appendix G reflect application of the superseded year 2000 version of the HCM.

To ensure the accuracy of the DEIR traffic analysis, as well as consistency with City of Vacaville Resolution 2013-023, the intersection level of service calculations must be performed using the current, year 2010 version of the *Highway Capacity Manual*. After the LOS calculations are corrected, the DEIR will need to be recirculated for further public review.

13-110

4. **Roadway Segment Level of Service Analysis Methodology** – The analysis of roadway segment operations was performed using “. . . commonly-accepted default values derived by the Florida Department of Transportation.” (DEIR page 4.14-12) No evidence is presented, however, to verify that these Florida-based “default” values apply to California. Although the use of default values in a planning-level analysis is often considered acceptable, we note that the *Highway Capacity Manual* suggests that, “[a]gencies that use the methodology in this [Urban Street Segments] chapter are encouraged to develop a set of local default values based on field measurements on streets in their jurisdiction.” (Ref.: Transportation Research Board, *Highway Capacity Manual*, 2010, p. 17-67.)

Unless the validity of the Florida values can be confirmed, the roadway segment level of service analyses should be revised using locally-developed capacity assumptions.

13-111

5. **Obsolete Traffic Volume Data** – According to the DEIR (page 4.14-17), the intersection analysis results are based on turning movement counts performed in 2009 and 2010, three-to-four years ago. Accepted practice within the traffic engineering profession is to view such traffic volumes as obsolete. Page 19 of the 2006 Institute of Transportation Engineers (ITE) document, *Transportation Impact Analyses for Site Development*, specifically states that “. . . traffic volume data should generally be no older than 1 year.”

Because the traffic volumes represent the most critical input parameter in the intersection level of service calculation process, any inaccuracies in those values directly affects the validity of the level of service results. In short, to the extent that the existing peak-hour traffic volumes are inaccurate, the corresponding level of service results reported in the DEIR are invalid, and a misleading representation of the environmental setting and project-related impacts will be provided. (Because the future year traffic volumes were developed by adding projected traffic

13-112

growth onto the existing traffic volumes, any shortcomings in the existing conditions data will adversely affect the validity of the future year information.)

Updated traffic data must be obtained and the analysis must be revised using the current traffic volume information. The modified traffic impact analysis should then be incorporated into a revised DEIR, which must be recirculated for further public review.

6. ***Failure to Consider the Operational Effects of Truck Traffic*** – As noted on DEIR page 4.14-30, the City of Vacaville has an extensive network of truck routes traversing its local streets. That truck route network is illustrated on Figure TR-3 of the Transportation Element of the General Plan, which is presented here as Attachment A. Also presented in Attachment A is Figure 4.14-1 of the DEIR, which illustrates the locations of the study intersections. Comparison of the two figures reveals that the majority of the study intersections are located on designated truck routes, including routes on which extra-legal loads are allowed upon issuance of a permit.

A spot check of a limited number of the level of service calculations for intersections located on designated truck routes reveals that the DEIR's intersection calculations incorporated a default assumption of two percent trucks. Although the *Synchro* calculation sheets presented in DEIR Appendix G do not list the assumed truck percentage, we were able to reproduce certain of the intersection analysis results. For example, using a two percent "heavy vehicle" assumption, we replicated the level of service analysis results at Browns Valley Road/Glen Eagle Way and Meridian Road/I-80 Westbound Ramps, both of which are on truck routes.

To ensure that a traffic impact analysis conducted using the *Highway Capacity Manual* procedures fully accounts for truck traffic, the analysis of each study intersection incorporates a "heavy vehicle percentage."

In the unsignalized intersection level of service analysis procedure, that percentage is used to adjust the "critical gap" and the "follow-up time." In effect, the analysis is modified to reflect the greater amount of time needed for trucks to enter or cross the stream of traffic on the major road, due to the slower acceleration rate associated with their higher weight.

Similarly, the signalized intersection analysis includes consideration of the number of heavy vehicles. This is accomplished through incorporation of a "passenger-car equivalent" (PCE) factor. According to the *Highway Capacity Manual*, the passenger-car equivalent built into the signalized intersection analysis procedure is "2.0 passenger-car units" (i.e., one truck is equivalent to two passenger cars). Attachment B presents the relevant pages from the 2000 and 2010 versions of the *Highway Capacity Manual*. (References: Transportation Research Board, *Highway Capacity Manual*, 2000, page 16-10 and "Exhibit 16-7 – Adjustment Factors for Saturation Flow Rate," page 16-11; and Transportation Research Board, *Highway Capacity Manual*, 2010, page 18-36 and page 19-15.)

The failure to incorporate appropriate factors reflecting the presence of a substantial percentage of trucks in the prevailing traffic stream at study locations on designated truck routes results in unrealistic, overly-optimistic delay and level of service results. The intersection level of service analyses must be revised to reflect the actual composition of traffic in the study area.

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13-113



7. **Trip Generation Rates** – According to DEIR p. 4.14-37:

*The number of projected trips in Vacaville under each of the study scenarios was determined from the Citywide Model by applying trip rates for housing units and non-residential acres. The model trip rates are primarily derived from those published in Trip Generation by the Institute of Transportation Engineers.*

Because the specific trip generation rates employed in the analysis are not presented in the DEIR, it is impossible to judge whether those rates are appropriate. We note that the footnote associated with the excerpt presented above indicates that the Eighth Edition of the ITE *Trip Generation* publication was used. The current (Ninth) edition of that document was published in 2012, well in advance of the release date of the DEIR.

13-114

In order that the public may judge the appropriateness and validity of the trip generation rates employed in the analysis, those rates must be revealed, along with the detailed calculations that resulted in the trip generation estimates presented in DEIR Table 4.14-8. Those detailed calculations should indicate the number of residential units (single-family and multi-family) as well as the nature and magnitude of the non-residential uses assumed.

Furthermore, the trip generation estimates derived from use of the Eighth Edition of *Trip Generation* should be directly compared to a similar set of calculations based on application of the corresponding rates from the Ninth Edition of the *Trip Generation Manual*. If the updated rates result in substantially higher estimates of peak-hour trip generation, the analysis must be modified to incorporate new level of service calculations reflecting the corrected trip generation estimates.

13-115

8. **Analysis Baseline** – The DEIR trip generation discussion (p. 4.14-37) provides potentially misleading information, as it focuses on the comparison of the number of trips associated with the Proposed General Plan to the 1990 General Plan, rather than to Existing Conditions. Specifically, the DEIR states that the number of trips due to the Proposed General Plan would be “within 1 percent of the 2035 trips generated with the 1990 General Plan.” While this General Plan-to-General Plan comparison might be of limited interest, the key comparison for determination of environmental impacts relates to the increase in tripmaking from Existing Conditions to the Proposed General Plan. DEIR Table 4.14-8 reveals that the Proposed General Plan will increase the number of daily trips in Vacaville by 48 percent and the number of peak-hour trips will increase by 47 – 50 percent, which is obviously substantially greater than the one percent value that a careless reader might assume.

13-116

As noted above, we also suggest that derivation of the trip generation values for existing conditions must be documented in detail, in order that a reasonable determination can be made with respect to the validity of the analysis baseline. Were the estimates presented in DEIR Table 4.14-8 simply taken directly from the City’s travel demand forecasting model, or were they calculated manually by applying the ITE trip generation rates to current land use information? What measures, if any, have been taken to validate these estimates?

13-117

9. **Vehicle Miles Traveled Calculation** – DEIR Table 4.14-9 presents estimates of vehicle miles traveled (VMT) for the three analysis scenarios addressed in the traffic study: Existing (2008 Baseline), 1990 General Plan (2035), and Proposed General Plan (2035). Further, the estimates are broken down into three trip categories (Internal, Internal – External, and External – Internal), as well as Total Daily VMT. The average trip length associated with each of the

13-118



analysis scenarios is also presented, which indicates that implementation of the proposed General Plan will result in a 10 percent increase in average trip length over existing conditions, as well as a slight increase over the value associated with the 1990 General Plan. Total VMT is projected to increase by over 63 percent compared to existing conditions.

13-118  
cont.

As with the trip generation estimates discussed above, no specifics are provided with respect to the VMT calculations, thereby making it impossible to perform any meaningful review of these critical values. Because the VMT values are key inputs to the air quality and greenhouse gas analyses, it is important to ensure the validity of these values. (The DEIR Air Quality section refers readers to the “Traffic and Transportation” section “. . . for a description of the assumptions included in the 2035 traffic conditions,” yet no assumptions relating to the VMT derivation are presented.)

In addition, Table 4.14-9 presents a single overall value for average trip length for each analysis scenario. As an aid to understanding and potentially accepting the VMT estimates, it would be helpful to know the average trip lengths for the various trip categories (internal, internal-external, and external-internal) and trip purposes.

13-119

10. **Mitigation Measure Feasibility** – DEIR page 4.14-40 contains the following statement:

*If a mitigation measure is included in the proposed General Plan Transportation Element, it is considered to be part of the proposed project and is assumed to be able to be implemented as a mitigation measure. For these mitigation measures, implementation is assumed regardless of funding status, and the impact after mitigation is considered to be less than significant.*

To assume that a mitigation measure is feasible and implementable simply because it is included in the DEIR violates one of the basic principles of environmental analysis. Specifically, until there is a reasonable level of certainty that a particular mitigation measure can, in fact, be implemented, no mitigation exists. Transportation system improvements without a designated funding source remain speculative, and it is inappropriate to assume that they can be implemented.

13-120

Moreover, the DEIR must evaluate the potential environmental effects of each of the proposed mitigation measures. The DEIR lacks this information.

Without any meaningful indication of the availability of adequate funding for the necessary transportation system improvements or the potential environmental impacts of the improvements, it is impossible to state with certainty that the improvements are feasible and can actually be achieved. Thus, it is inappropriate to conclude that the associated impacts will be reduced to less than significant.

11. **Study Intersections** – Although the DEIR “Traffic and Transportation” analysis includes a wide range of intersections across Vacaville and even in Fairfield, it ignores a number of locations that the City has deemed worthy of inclusion within its City-wide Transportation Operations Monitoring program. According to the General Plan Update existing conditions report entitled, *Transportation and Circulation in Vacaville*, 89 such intersections were included in the January 2007 *City of Vacaville Infrastructure, Facilities, and Services Status Report*. Selected locations that the City includes in its Citywide monitoring program, but were ignored in the General Plan Update DEIR include the following:

13-121



- Alamo Drive/Bel Air Drive
- Alamo Drive/Tulare Drive,
- Alamo Drive/Mariposa Avenue,
- Alamo Drive/Alamo Lane,
- Mason Street/McClellan Street,
- Elmira Road/Shasta Drive/Aegean Way,
- Elmira Road/Beelard Drive,
- Elmira Road/Christine Drive,
- E. Monte Vista Avenue/Callen Street,
- Allison Drive/Ulatis Drive,
- Nut Tree Road/Bel Air Drive,
- Nut Tree Road/Yellowstone Drive,
- Nut Tree Road/Helen Way,
- Peabody Road/Caldwell Drive,
- Peabody Road/Southwood Drive,
- Peabody Road/Beelard Drive,
- Peabody Road/Berryessa Drive,
- Davis Street/Marshall Road,
- Merchant Street/Orchard Avenue, and
- Merchant Street/Walnut Avenue.

If these intersections are worthy of being included in the City's traffic monitoring program, they should be included in the General Plan Update DEIR. Failure to do so results in an incomplete analysis of the proposed plan's impacts on the local circulation system.

## CONCLUSION

Our review of the "Traffic and Transportation" analysis incorporated into the Draft Environmental Impact Report for the proposed City of Vacaville General Plan Update revealed several issues potentially affecting the validity of the conclusions presented in that document. Further, our review indicates that the proposed project will have additional significant impacts on the environment beyond those identified in the EIR, particularly with respect to degradation of freeway level of service. These issues should be addressed prior to City of Vacaville approval of the proposed General Plan Update and the associated environmental documentation.

13-121  
cont.

13-122



Ms. Laurel L. Impett, AICP  
December 10, 2013  
Page 9

We hope this information is useful. If you have questions concerning any of the items presented here or would like to discuss them further, please feel free to contact me at (916) 783-3838.

13-122  
cont.

Sincerely,

**MRO ENGINEERS, INC.**

A handwritten signature in blue ink, reading "Neal K. Liddicoat".

Neal K. Liddicoat, P.E.  
Traffic Engineering Manager

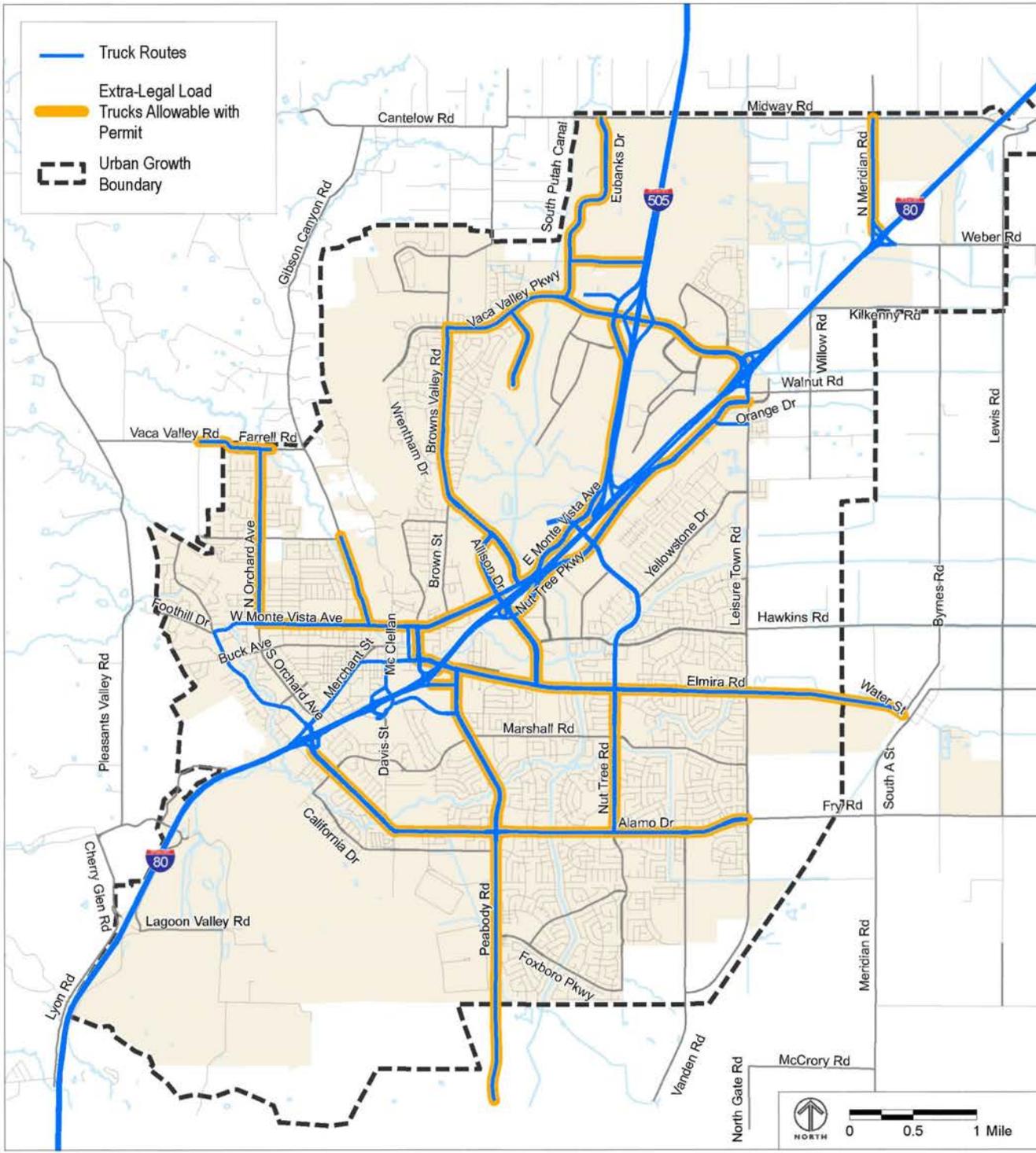


**ATTACHMENT A**  
**DEIR Study Intersections**  
**and**  
**City of Vacaville Truck Routes**

13-123



CITY OF VACAVILLE  
 VACAVILLE GENERAL PLAN  
 TRANSPORTATION ELEMENT



13-123  
 cont.

Source: City of Vacaville Municipal Code Chapter 10.32

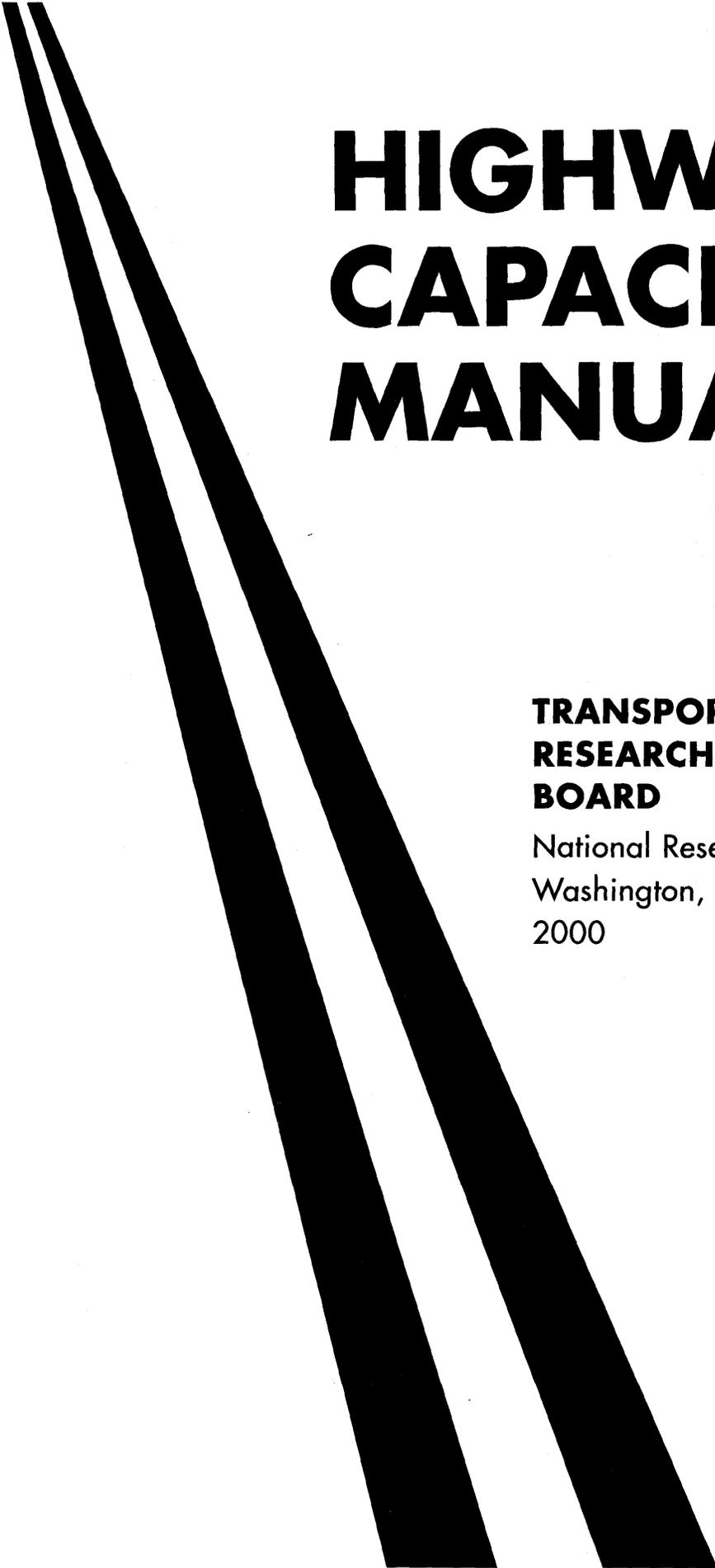
Note: Leisure Town Road is not a designated truck route. However, consistent with State and local policy, Leisure Town Road may be used by trucks, and by extra-legal loads with appropriate permits, that have origins or destinations in the vicinity of Leisure Town Road.

FIGURE TR-3  
 TRUCK ROUTES

**ATTACHMENT B**

**Excerpts from  
*Highway Capacity Manual*  
(Transportation Research Board, 2000 and 2010)**

**13-123  
cont.**



# **HIGHWAY CAPACITY MANUAL**

**TRANSPORTATION  
RESEARCH  
BOARD**

National Research Council  
Washington, D.C.  
2000

13-123  
cont.

**HCM**2000

Field measurement method for saturation flow is described in Appendix H

Appendix H presents a field measurement method for determining saturation flow rate. Field-measured values of saturation flow rate will produce more accurate results than the estimation procedure described here and can be used directly without further adjustment.

**Base Saturation Flow Rate**

Computations begin with the selection of a base saturation flow rate, usually 1,900 passenger cars per hour per lane (pc/h/ln). This value is adjusted for a variety of conditions. The adjustment factors are given in Exhibit 16-7.

**Adjustment for Lane Width**

The lane width adjustment factor,  $f_w$ , accounts for the negative impact of narrow lanes on saturation flow rate and allows for an increased flow rate on wide lanes. Standard lane widths are 12 ft. The lane width factor may be calculated with caution for lane widths greater than 16 ft, or an analysis using two narrow lanes may be conducted. Note that use of two narrow lanes will always result in a higher saturation flow rate than a single wide lane, but in either case, the analysis should reflect the way in which the width is actually used or expected to be used. In no case should the lane width factor be calculated for widths less than 8.0 ft.

**Adjustment for Heavy Vehicles and Grade**

The effects of heavy vehicles and approach grades are treated by separate factors,  $f_{HV}$  and  $f_g$ , respectively. Their separate treatment recognizes that passenger cars are affected by approach grades, as are heavy vehicles. Heavy vehicles are defined as those with more than four tires touching the pavement. The heavy-vehicle factor accounts for the additional space occupied by these vehicles and for the difference in operating capabilities of heavy vehicles compared with passenger cars. The passenger-car equivalent ( $E_T$ ) used for each heavy vehicle is 2.0 passenger-car units and is reflected in the formula. The grade factor accounts for the effect of grades on the operation of all vehicles.

**Adjustment for Parking**

The parking adjustment factor,  $f_p$ , accounts for the frictional effect of a parking lane on flow in an adjacent lane group as well as for the occasional blocking of an adjacent lane by vehicles moving into and out of parking spaces. Each maneuver (either in or out) is assumed to block traffic in the lane next to the parking maneuver for an average of 18 s. The number of parking maneuvers used is the number of maneuvers per hour in parking areas directly adjacent to the lane group and within 250 ft upstream from the stop line. If more than 180 maneuvers per hour exist, a practical limit of 180 should be used. If the parking is adjacent to an exclusive turn lane group, the factor only applies to that lane group. On a one-way street with no exclusive turn lanes, the number of maneuvers used is the total for both sides of the lane group. Note that parking conditions with zero maneuvers have a different impact than a no-parking situation.

**Adjustment for Bus Blockage**

The bus blockage adjustment factor,  $f_{bb}$ , accounts for the impacts of local transit buses that stop to discharge or pick up passengers at a near-side or far-side bus stop within 250 ft of the stop line (upstream or downstream). This factor should only be used when stopping buses block traffic flow in the subject lane group. If more than 250 buses per hour exist, a practical limit of 250 should be used. When local transit buses are believed to be a major factor in intersection performance, Chapter 27 may be consulted for more information on this effect. The factor used here assumes an average blockage time of 14.4 s during a green indication.

Do not use width < 8.0 ft for calculations



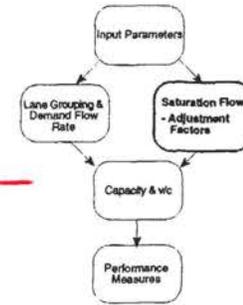
Parking maneuver assumed to block traffic for 18 s. Use practical limit of 180 maneuvers/h.

Applies to bus stops within 250 ft of the stop line and a limit of 250 buses/h

13-123 cont.

EXHIBIT 16-7. ADJUSTMENT FACTORS FOR SATURATION FLOW RATE<sup>a</sup>

Factor	Formula	Definition of Variables	Notes
Lane width	$f_w = 1 + \frac{(W - 12)}{30}$	W = lane width (ft)	W ≥ 8.0 If W > 16, a two-lane analysis may be considered
Heavy vehicles	$f_{HV} = \frac{100}{100 + \%HV(E_T - 1)}$	% HV = % heavy vehicles for lane group volume	E <sub>T</sub> = 2.0 pc/HV
Grade	$f_g = 1 - \frac{\%G}{200}$	% G = % grade on a lane group approach	-6 ≤ % G ≤ +10 Negative is downhill
Parking	$f_p = \frac{N - 0.1 - \frac{18N_m}{3600}}{N}$	N = number of lanes in lane group N <sub>m</sub> = number of parking maneuvers/h	0 ≤ N <sub>m</sub> ≤ 180 f <sub>p</sub> ≥ 0.050 f <sub>p</sub> = 1.000 for no parking
Bus blockage	$f_{bb} = \frac{N - \frac{14.4N_B}{3600}}{N}$	N = number of lanes in lane group N <sub>B</sub> = number of buses stopping/h	0 ≤ N <sub>B</sub> ≤ 250 f <sub>bb</sub> ≥ 0.050
Type of area	f <sub>a</sub> = 0.900 in CBD f <sub>a</sub> = 1.000 in all other areas		
Lane utilization	f <sub>LU</sub> = v <sub>g</sub> / (v <sub>g1</sub> N)	v <sub>g</sub> = unadjusted demand flow rate for the lane group, veh/h v <sub>g1</sub> = unadjusted demand flow rate on the single lane in the lane group with the highest volume N = number of lanes in the lane group	
Left turns	Protected phasing: Exclusive lane: f <sub>LT</sub> = 0.95 Shared lane: $f_{LT} = \frac{1}{1.0 + 0.05P_{LT}}$	P <sub>LT</sub> = proportion of LTs in lane group	See Exhibit C16-1, Appendix C, for nonprotected phasing alternatives
Right turns	Exclusive lane: f <sub>RT</sub> = 0.85 Shared lane: f <sub>RT</sub> = 1.0 - (0.15)P <sub>RT</sub> Single lane: f <sub>RT</sub> = 1.0 - (0.135)P <sub>RT</sub>	P <sub>RT</sub> = proportion of RTs in lane group	f <sub>RT</sub> ≥ 0.050
Pedestrian-bicycle blockage	LT adjustment: f <sub>Lpb</sub> = 1.0 - P <sub>LT</sub> (1 - A <sub>pbT</sub> ) (1 - P <sub>LTA</sub> ) RT adjustment: f <sub>Rpb</sub> = 1.0 - P <sub>RT</sub> (1 - A <sub>pbT</sub> ) (1 - P <sub>RTA</sub> )	P <sub>LT</sub> = proportion of LTs in lane group A <sub>pbT</sub> = permitted phase adjustment P <sub>LTA</sub> = proportion of LT protected green over total LT green P <sub>RT</sub> = proportion of RTs in lane group P <sub>RTA</sub> = proportion of RT protected green over total RT green	Refer to Appendix D for step-by-step procedure

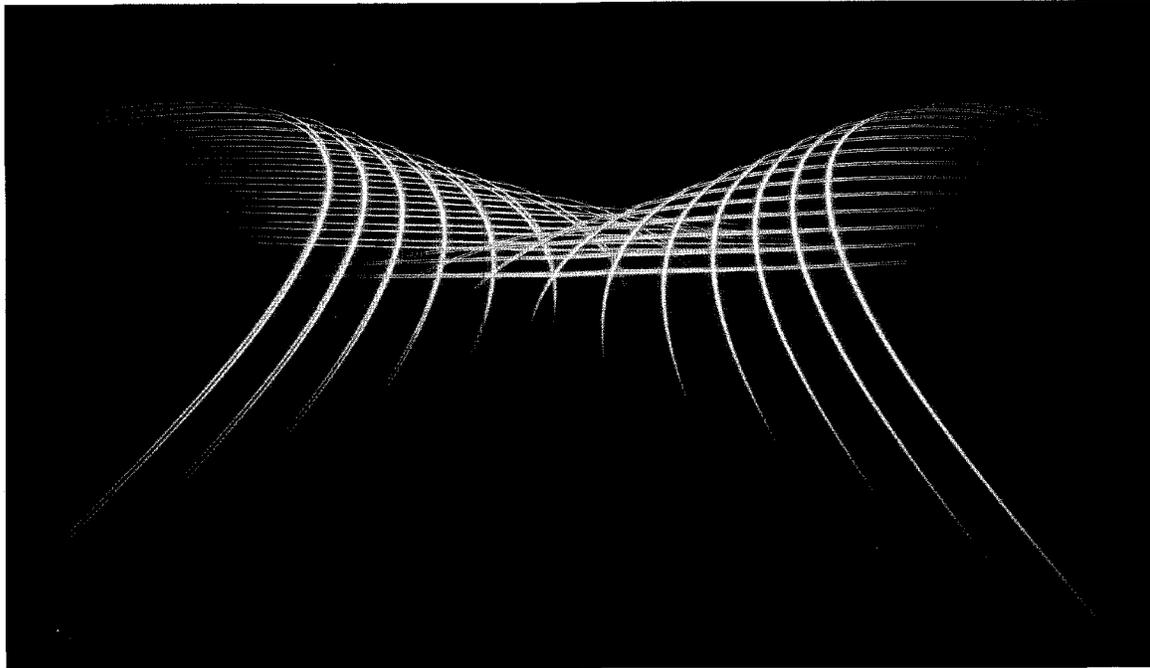


Note:  
See Chapter 10, Exhibit 10-12, for default values of base saturation flow rates and variables used to derive adjustment factors.  
a. The table contains formulas for all adjustment factors. However, for situations in which permitted phasing is involved, either by itself or in combination with protected phasing, separate tables are provided, as indicated in this exhibit.

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cont.

# HCM2010

## HIGHWAY CAPACITY MANUAL



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cont.

### VOLUME 3: INTERRUPTED FLOW



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intersections in the jurisdiction (or area) within which the subject intersection is located. Default values for this rate are provided in Section 3, Applications.

**Adjustment for Lane Width**

The lane width adjustment factor  $f_w$  accounts for the negative impact of narrow lanes on saturation flow rate and allows for an increased flow rate on wide lanes. Values of this factor are listed in Exhibit 18-13.

**Exhibit 18-13**  
Lane Width Adjustment  
Factor

Average Lane Width (ft)	Adjustment Factor ( $f_w$ )
<10.0 <sup>a</sup>	0.96
≥10.0–12.9	1.00
>12.9	1.04

Note: <sup>a</sup> Factors apply to average lane widths of 8.0 ft or more.

Standard lanes are 12 ft wide. The lane width factor may be used with caution for lane widths greater than 16 ft, or an analysis with two narrow lanes may be conducted. Use of two narrow lanes will always result in a higher saturation flow rate than a single wide lane, but, in either case, the analysis should reflect the way the width is actually used or expected to be used. In no case should this factor be used to estimate the saturation flow rate of a lane group with an average lane width that is less than 8.0 ft.

**Adjustment for Heavy Vehicles**

The heavy-vehicle adjustment factor  $f_{HV}$  accounts for the additional space occupied by heavy vehicles and for the difference in their operating capabilities, compared with passenger cars. This factor does not address local buses that stop in the intersection area. Values of this factor are computed with Equation 18-6.

**Equation 18-6**

$$f_{HV} = \frac{100}{100 + P_{HV}(E_T - 1)}$$

where

$P_{HV}$  = percent heavy vehicles in the corresponding movement group (%), and

$E_T$  = equivalent number of through cars for each heavy vehicle = 2.0.

**Adjustment for Grade**

The grade adjustment factor  $f_g$  accounts for the effects of approach grade on vehicle performance. Values of this factor are computed with Equation 18-7.

**Equation 18-7**

$$f_g = 1 - \frac{P_g}{200}$$

where  $P_g$  is the approach grade for the corresponding movement group (%).

This factor applies to grades ranging from -6.0% to +10.0%. An uphill grade has a positive value and a downhill grade has a negative value.

**Adjustment for Parking**

The parking adjustment factor  $f_p$  accounts for the frictional effect of a parking lane on flow in the lane group adjacent to the parking lane. It also accounts for the occasional blocking of an adjacent lane by vehicles moving into and out of

13-123  
cont.

**Step 4: Determine Critical Headways and Follow-Up Headways**

The critical headways  $t_{c,x}$  and follow-up headways  $t_{f,x}$  must be determined for the major-street left turns ( $v_{c,1}$  and  $v_{c,4}$ ), the minor-street right turns ( $v_{c,9}$  and  $v_{c,12}$ ), the major-street U-turns ( $v_{c,1U}$  and  $v_{c,4U}$ ), the minor-street through movements ( $v_{c,8}$  and  $v_{c,11}$ ), and the minor-street left turns ( $v_{c,7}$  and  $v_{c,10}$ ) as they occur at a TWSC intersection.

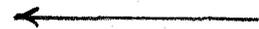
To compute the critical headways for each movement, the analyst begins with the base critical headway given in Exhibit 19-10 and makes movement-specific adjustments relating to the percentage of heavy vehicles, the grade encountered, and a three-leg versus four-leg intersection, as shown in Equation 19-30:

$$t_{c,x} = t_{c,base} + t_{c,HV}P_{HV} + t_{c,G}G - t_{3,LT}$$

**Equation 19-30**

where

- $t_{c,x}$  = critical headway for movement  $x$  (s);
- $t_{c,base}$  = base critical headway from Exhibit 19-10 (s);
- $t_{c,HV}$  = adjustment factor for heavy vehicles (1.0 for major streets with one lane in each direction; 2.0 for major streets with two or three lanes in each direction) (s);
- $P_{HV}$  = proportion of heavy vehicles for movement (expressed as a decimal; e.g.,  $P_{HV} = 0.02$  for 2% heavy vehicles);
- $t_{c,G}$  = adjustment factor for grade (0.1 for Movements 9 and 12; 0.2 for Movements 7, 8, 10, and 11) (s);
- $G$  = percent grade (expressed as an integer; e.g.,  $G = -2$  for a 2% downhill grade); and
- $t_{3,LT}$  = adjustment factor for intersection geometry (0.7 for minor-street left-turn movement at three-leg intersections; 0.0 otherwise) (s).



$t_{3,LT}$  is applicable to Movements 7, 8, 10, and 11

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cont.

Vehicle Movement	Base Critical Headway, $t_{c,base}$ (s)		
	Two Lanes	Four Lanes	Six Lanes
Left turn from major	4.1	4.1	5.3
U-turn from major	N/A	6.4 (wide) 6.9 (narrow)	5.6
Right turn from minor	6.2	6.9	7.1
Through traffic on minor	1-stage: 6.5	1-stage: 6.5	1-stage: 6.5*
	2-stage, Stage I: 5.5 2-stage, Stage II: 5.5	2-stage, Stage I: 5.5 2-stage, Stage II: 5.5	2-stage, Stage I: 5.5* 2-stage, Stage II: 5.5*
Left turn from minor	1-stage: 7.1	1-stage: 7.5	1-stage: 6.4
	2-stage, Stage I: 6.1 2-stage, Stage II: 6.1	2-stage, Stage I: 6.5 2-stage, Stage II: 6.5	2-stage, Stage I: 7.3 2-stage, Stage II: 6.7

**Exhibit 19-10**  
Base Critical Headways for TWSC Intersections

\* Use caution; values estimated.

The critical headway data for four- and six-lane sites account for the actual lane distribution of traffic flows measured at each site. For six-lane sites, minor-street left turns were commonly observed beginning their movement while apparently conflicting vehicles in the far-side major-street through stream pass. The values for critical headway for minor-street through movements at six-lane streets are estimated, as the movement is not frequently observed in the field.

# Exhibit B

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EXHIBIT

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# Exhibit B

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cont.

**California Coastal Commission**

# PROCEDURAL GUIDANCE FOR THE REVIEW OF WETLAND PROJECTS IN CALIFORNIA'S COASTAL ZONE



June 15, 1994



Financial assistance for preparation of this document was provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

## Preface

### A Note On The Use Of This Document

The Coastal Act provides strong enforceable policies for the protection of wetlands in the coastal zone. However, the accumulation of new scientific information on wetlands and the inevitability, over time, of staff changes gave rise to the need for a consistent framework for the application of those policies by Commission staff in their preparation of proposed findings for the Commission. Based on that need, the Commission sought and obtained a federal grant to develop the document: *Procedural Guidance for the Review of Wetland Projects in California's Coastal Zone*.

The development of this new procedural guidance document will significantly improve the quality and comprehensiveness of the Commission staff's analysis and of the recommendations upon which the Commission bases its decisions; thus enhancing the Commission's ability to protect the State's coastal wetland resources. It is important, however, to accurately characterize this document and explicitly delineate its appropriate use.

Consistent with the authority delegated to the executive director by the Commission to direct the work of staff, and consistent with the Commission's duty to examine projects, amendments, and other items for Commission action on a case-by-case basis, this procedural guidance document will provide staff with relevant background information and an analytic framework for drafting proposed findings and recommendations. Although the sources of information (e.g., scientific research results or precedential Commission actions) contained in this document can and will be referenced when developing a staff report, this procedural guidance document itself will not be cited, quoted, or relied upon as the basis for recommendations or findings contained in any staff report.

This is a publication of the State of California, California Coastal Commission pursuant to National Oceanic and Atmospheric Administration Award Number NA270Z088-01. Financial assistance for preparation of this document was provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

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**California Coastal Commission**

# PROCEDURAL GUIDANCE FOR THE REVIEW OF WETLAND PROJECTS IN CALIFORNIA'S COASTAL ZONE

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## CHAPTER TWO

### AN OVERVIEW OF MITIGATION PROCESSES AND PROCEDURES

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#### **I. Introduction:**

Mitigation for the adverse affects of development projects in wetlands can take on a variety of forms. Compensatory mitigation (enhancement, restoration, or creation) is the most common mitigation proposed in coastal development permit applications. However, under certain circumstances the CCC has also accepted less desirable mitigation alternatives such as in-lieu fees and contributions to mitigation banks. Although a variety of mitigation alternatives exist, all of them have drawbacks and limitations. (Not the least of which is the large amount of money often required to undertake a mitigation program.) Numerous partially successful, or failed mitigation projects attest to the fact that mitigation is not a panacea. Past experience clearly shows a great deal of effort is required by all parties to ensure successful mitigation.

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This chapter presents a brief overview of several common mitigation alternatives for proposed projects directly affecting wetlands. Additionally, the chapter presents information on mitigation ratios, and more detailed information on restoration plans.

#### **II. Mitigation Defined:**

Although the Coastal Act does not define mitigation, the California Environmental Quality Act does. Under CEQA, mitigation includes all of the following:

- a) Avoiding the impact altogether by not taking a certain action or parts of an action.*
- b) Minimizing impact by limiting the degree or magnitude of the action and its implementation.*
- c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.*
- d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.*
- e) Compensating for the impact by replacing or providing substitute resources or environments.*

This definition is hierarchical with avoidance being the most preferred type of mitigation and compensation being the least preferred type.

Past experience in reviewing applications for coastal development permits shows applicants rely heavily on compensatory mitigation to minimize habitat loss, regardless of the impacts. Typically, compensation measures are included as an integral part of the project design. This form of mitigation is often justified through arguments designed to show that the wetland acreage enhanced or restored is equal to the acreage lost. However, this concept of compensatory mitigation often fails to recognize the complexity of the wetland ecosystem, its relationship to the watershed, and the fact that wetland functions may not be directly related to acreage. Additionally, the success of compensatory mitigation — especially restoration projects — is not proven. Overall, more emphasis should be placed on mitigation alternatives that include wetland impact avoidance and minimization. Compensation for wetland impacts should only be considered as the last alternative, and only if there are no other less environmentally damaging feasible alternatives.

### III. Types of Mitigation:

#### A) Avoidance:

Avoidance of project impacts is the preferred mitigation alternative under CEQA. Through this form of mitigation, adverse impacts are avoided altogether through alteration of project location, design, or other related aspects. For obvious reasons, this mitigation alternative is not generally preferred by permit applicants, since it requires a change (possible substantial) in the proposed project. Yet in evaluating mitigation alternatives, CCC staff should give first consideration to impact avoidance for all or some of the proposed project impacts.

#### B) Enhancement, Restoration, and Creation:

The enhancement, restoration, or creation of wetlands are three types of compensatory mitigation. In this document, enhancement is considered a mitigation activity that improves the size or function of degraded or other existing wetlands. Restoration is considered a mitigation activity that re-establishes a former wetland. Creation is considered a mitigation activity that results in the formation of a new wetland.

Although not without drawbacks, enhancement of an existing wetland is among the most common type of compensatory mitigation. The principal shortcoming of most proposed enhancement projects is that they can often result in a net loss of wetland acreage (Table 1). Only through the restoration of former wetlands or through the creation of new wetlands can no-net-loss be achieved. Enhancing existing (e.g., degraded) wetlands as mitigation for wetland resources does not provide additional wetland acreage, but can increase the function and value of existing habitat.

Table 1. A COMPARISON AMONG COMMONLY PROPOSED TYPES OF WETLAND COMPENSATORY MITIGATION PROJECTS

Type of Mitigation	Advantages	Disadvantages
Enhancement of degraded wetlands with some existing functional value.	Good chances of success, since project located in an existing wetland ecosystem.	Net loss of wetland area and/or functions.
Restoration of former wetlands area with no present functional value.	Net gain of wetland acreage and function. Success rate higher than for projects creating new	Still somewhat experimental. May be a long time between loss of developed wetland and completion of the

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cont.

	wetlands.	restoration project.
Creation of a new wetland site not adjacent to existing wetland.	Provides greater flexibility for mitigating impacts.	Still experimental. Success rate is low. Functional value not well documented.

CCC staff should review wetland enhancement projects carefully. All wetlands in coastal California are extremely valuable, even if degraded, because of the dramatic loss in wetlands throughout the State, and the unique habitats wetlands provide. In urban areas, the remaining wetlands still support important plant and animal species. Though many of these wetlands are disturbed by human activities, they can still be a significant resource.

In contrast to enhancement projects, the restoration of a former wetland can result in a net increase in both wetland acreage and function (Table 1). Restoration of a former wetland is by no means foolproof, but may have a reasonable chance of re-establishing fundamental wetland characteristics such as the proper elevation or hydrology. However, having no guarantee the restoration project will achieve the stated goals in the specified time frame is a major concern regarding wetland restoration. To provide a higher probability of success, the restoration project should be located adjacent to a functioning wetland. Isolated restoration sites will probably have a lower chance of sustaining maximum function and values, due to isolation from seed sources, and limitations on the migration and dispersion of wetland animals. Established connections among wetlands can be critically important in the event of local catastrophes, which can result in localized extinction without inputs from other wetlands.

The creation of a new wetland is probably the most uncertain type of compensatory mitigation (Table 1). Not only must the project provide the proper form and balance of fundamental characteristics, but it must also result in a system that is self-sustaining or provide for a permanent maintenance program. Creating new wetlands has many of the problems associated with wetland enhancement and restoration projects. Additionally, it can be a very long time from the creation of a new wetland to the establishment of functions and values equal to those lost through development. Thus, there is an interim (often permanent) loss of functions and values. CCC staff should be very cautious in recommending wetland creation projects as mitigation for the loss of existing wetlands.

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### **C) In-Lieu Fees and Wetland Mitigation Banks:**

In-lieu fees and wetland mitigation banks are two types of compensatory mitigation that result in the applicant allocating funds for the augmentation of wetlands. Typically, in-lieu fees are funds placed in one or more accounts designated for restoration, enhancement, or preservation of existing wetland resources. In contrast, wetland mitigation banks are either existing or newly created wetland areas that are available for purchase and subsequent management and preservation. In practice, funds paid by the applicant are used to purchase a portion (i.e., credits) of an existing wetland mitigation bank, or are used to fund the creation of a new bank. Using a pre-negotiated formula, the applicant draws on the purchased credits to mitigate for wetland impacts arising from the development project.

In-lieu fees and mitigation bank purchases have generally met with limited success in serving as adequate mitigation for wetland losses. As previously discussed, there are numerous technical difficulties inherent to wetland creation and restoration. Additionally, the allocation of funds through these alternatives are generally not tied to a specific type of mitigation. Thus, there is a reduced chance for in-kind mitigation, and even less chance the mitigation site will be near the impact site. Project time lags can also reduce the overall success of mitigation due to the loss of wetland functions between the time of adverse impacts, the collection of adequate funds to undertake the project, and completion of the mitigation project. Resource management agencies have also found that the complete cost of mitigation is not always

accounted for in the fees collected, while mitigation bank funds are not always adequate to implement the bank project in a timely fashion. Wetland restoration costs remain high—particularly the purchase of coastal property—especially in southern California, where land is extremely expensive.

Mitigation banks raise special problems of their own. More often than not, the promised mitigation is never realized. Simply put, resource scientists do not know how to build sustainable wetlands that match the functions and productivity of natural wetlands. Thus, any broad use of mitigation banks could lead to a net loss of wetland habitat. Moreover, resource agencies are concerned that the creation of mitigation banks will reduce the barriers to filling wetlands and estuaries, and may even encourage projects, as bank sponsors seek to recover their costs. On a broader scale, there is strong interest at many levels of government in formalizing the mitigation bank process and expanding its use as a viable mitigation alternative for wetland impacts. Nevertheless, it is recommended that CCC staff coordinate with resource agencies to determine the success of a mitigation bank's activities **prior** to recommending an applicant's involvement in the bank as mitigation for wetland development impacts.

In-lieu fees or contributions to wetland mitigation banks should not be used because the applicant is having difficulty in locating a suitable mitigation site. Often this approach only transfers the problem of locating an appropriate mitigation site to a public agency. CCC staff are encouraged to work with the applicant to reach an environmentally acceptable decision regarding mitigation prior to initiation of the project.

In evaluating various mitigation options, CCC staff should remember that mitigation banks and in-lieu fees are alternatives not solutions. Mitigation banks and in-lieu fees are forms of compensatory mitigation, which under CEQA is the least preferred alternative.

#### **IV. Mitigation Ratios:**

When an applicant proposes to restore or create a wetland as mitigation for impacts from development, the CCC must determine if the quantity and quality of the proposed mitigation will adequately compensate for the wetland area lost through development. Resource and regulatory agencies have usually required additional acreage beyond that lost through development, because of interim losses in wetland acreage and functional capacity, and because the success and resulting value of compensatory mitigation projects are uncertain. The ratio of wetland acreage created or restored to the wetland acreage lost to development is termed the wetland replacement ratio or mitigation ratio. Wetland replacement ratios may vary depending on the acreage, functions, and values of the wetland lost to development and the type of mitigation proposed.

To refine and standardize the process of determining mitigation ratios, some agencies have relied on technically based habitat evaluation methods such as the Habitat Evaluation Procedure (HEP) and the Wetland Evaluation Technique (WET). These procedures are complex and include evaluation criteria that are both objective and subjective. Unfortunately, several of the evaluation criteria do not accurately account for the ecological processes present in California's coastal wetlands and this is a major difficulty with the use of HEP and WET in California (Onuf and Quammen, 1985). In an attempt to address this problem a modified version of HEP was developed for use in evaluating California's coastal wetlands. However, this modified HEP has been characterized as even more subjective than the original procedure. Additionally, the use of these methods can result in erroneous information under certain situations. For example, through these techniques it is possible to conclude that a smaller wetland restored to a higher value offsets the loss of a larger wetland with lower values (e.g., a degraded wetland). Finally, a full evaluation under HEP or WET is very involved requiring a great deal of biological, physical, and chemical information. Unfortunately, the required information is often incomplete or nonexistent for many of California's coastal wetlands, rendering completion of these procedures unrealistic.

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Because of the controversy and inherent problems associated with HEP and WET, CCC staff are discouraged from using information and results from these procedures to determine wetland replacement ratios. The preferred procedure is to use the results from the functional capacity analysis (see chapter one), which provides for the preservation of both wetland acreage and functional capacity, in evaluating the adequacy of compensatory mitigation and mitigation ratios. In determining if functional capacity is maintained, both the adverse impacts and the proposed mitigation must be evaluated. In order to maintain functional capacity and wetland acreage, a mitigation plan should at least include the following:

- A wetland mitigation ratio in excess of one to one (i.e., one wetland acre must be restored or created for each acre lost through development). Many coastal development permits<sup>14</sup> have required a mitigation ratio of four to one to compensate for wetland acreage and functional capacity lost during the re-establishment and maturation of the mitigation area. In some cases, larger mitigation ratios have been required to ensure that at least some compensation occurs in the event the mitigation project is only partially successful. Enhancement of degraded habitat may be included as a **component** of a mitigation plan if the total package results in an acceptable mitigation ratio.
- Wetland creation projects should be located adjacent to existing wetland habitat whenever possible, to increase the probability for success.
- Wetland creation projects should replace the same habitat type, preferably in the same watershed or area. However, if a regional management plan has been prepared for the area that demonstrates the need for a specific habitat type, the CCC **may consider** replacement with the identified critical habitat, provided that this replacement is endorsed by the appropriate fish and wildlife management agencies.

## V. Enhancement and Restoration:

### A. Effectiveness of Enhancement and Restoration:

Wetland enhancement and restoration projects are among the most common types of wetland mitigation submitted with coastal development permit applications. Wetland enhancement and restoration efforts in California have been criticized because of an overall failure to fulfill the goal of no net loss and a failure to replace lost wetland values. These failures are due to many factors, including a lack of project completion, limited project success, and unclear goals and evaluation criteria. For example, in a review of 58 wetland mitigation projects in the San Francisco Bay area, Eliot (1985) found that very few of the projects achieved the stated goals. Additionally, Maguire (1985) identified the inability to accurately evaluate the effectiveness of restoration projects as a continuing problem because of:

- Unclear objectives.
- Insufficient technical detail in the design.
- Inadequate identification of the type and quantity of habitat lost through development.
- Inadequate baseline data regarding the biological, physical, and chemical condition of the restoration area.

However, a more recent study by Josselyn et al. (1993) found that 13 out of 22 (59%) Coastal Conservancy sponsored wetland restoration projects were effective in meeting initial project goals. This success rate is high compared to results of evaluations focusing on wetland mitigation projects (Josselyn et al., 1990). This higher success rate was expected due to the extensive planning that goes into Conservancy projects, the frequent interaction among various resource and regulatory agencies and the Conservancy, and the funding of project grantees who have a genuine interest in restoring wetlands (Josselyn et al., 1993). While wetland mitigation success remains low, the results of Conservancy sponsored projects suggests the potential exists for increasing the success rate.

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cont.

## B. Designing an Effective Enhancement or Restoration Plan:

The creation of a well designed enhancement or restoration plan is a complex process involving all of the following:

- Determination of regional habitat goals.
- Determination of enhancement or restoration goals and objectives.
- Detailed documentation of on-site conditions.
- Comparison of on-site conditions with regional goals and selecting priority species and habitats for the mitigation area.
- A detailed description of the post- enhancement or restoration environment and essential components, and a description of the materials and methods used to achieve that environment.
- A detailed and comprehensive review of the enhancement or restoration plan and revision as necessary.
- Development of the final plan.

The following is a list of design criteria and standards that should be used by applicants in developing an enhancement or restoration plan<sup>15</sup>:

1) *Maximize the chances for success*: If a wetland mitigation plan proposes to enhance a degraded wetland area, then enhancement should ultimately improve the function and values with the least amount of habitat modification. Using enhancement of degraded wetlands as mitigation is discouraged because there is often a net loss of wetland area, especially when the area lost through development is considered. However, incorporating an existing wetland ecosystem (no matter how disturbed) into the mitigation plan can dramatically improve the chances of a successful project over creating new, isolated wetlands. An existing wetland will serve as a reservoir of biota that can colonize restored areas and ensure long-term survival of the wetland. Since most new wetlands are isolated, they will not have this reservoir to draw from, and it will be difficult for the wetland to attain the level of diversity and function of a self-sustaining wetland ecosystem.

2) *Maximize wetland size*: Mitigation plans should strive to maximize wetland size by choosing sites adjacent to or connected with existing functional wetlands. Such plans must also include provisions for the appropriate habitats (e.g., open water, marshland vegetation, mudflat, etc.) in the proper proportions. Large consolidated areas can offer larger habitats and a greater number of habitats resulting in greater species diversity and population size. However, this criterion should not be interpreted as justification to consolidate remaining wetland acreage into "wetland reservations", which would result in a loss of important adjacent upland habitat and can work against the existence of rare species and habitats.

3) *Maintain linkages between wetlands*: Where two or more wetland habitats or systems are connected, a mitigation plan should maintain these linkages. Wetland connections should not be severed by development. These connections are vitally important as migration corridors and transition zones between wetlands and adjacent habitats. These connections are also critical for the recolonization of wetlands that suffer local catastrophes such as lagoon closures, or episodes of acute toxicity.

4) *Establish and maintain buffer areas*: Buffer areas are undeveloped lands surrounding wetlands. These areas act to protect the wetland from the direct effects of nearby disturbance (both acute and chronic), and provide habitat for organisms that spend only a portion of their life in the wetland such as amphibians, reptiles, birds and mammals. (See chapter one for more information on buffers.)

5) *Use of existing vegetation and soil*: Mitigation projects should strive to salvage the wetland vegetation and topsoil removed during construction for use in the mitigation area. Additional plant material should

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be drawn from local sources so that local gene pools are maintained. Non-native wetland plants or plants and soils from different regions should not be used at the restoration site.

6) *Revegetation*: The success of revegetation can be enhanced by planting species at their elevation of greatest natural abundance and in soils with a salinity no higher than those found in the native habitat. In addition, transplanted vegetation may require additional maintenance, such as watering or enclosures to prevent grazing, until they become established.

7) *Consider elevation and topography*: The elevation and topography of wetland areas is critical to determining the hydrologic regime and the resulting habitats. Elevation changes on the order of centimeters can have dramatic effects on the wetland ecosystem. Not only must the elevations be determined accurately, there must be sufficient detail so that an overall understanding of the landscape topography is clear. For example, intertidal habitat should slope towards the channel at an even grade of one to two percent to reduce ponding and maximize the intertidal area.

8) *Consider Hydrology*: The source and supply of water to the wetland is key to determining the overall structure of the ecosystem. For wetlands connected to the ocean, the tidal prism must be sufficient to provide adequate exchange of saltwater over the tidal cycle. This is especially important in lagoons where closure of the lagoon mouth may or may not be a natural phenomenon. Designs for new wetlands must incorporate protection from the direct force of waves and tidal currents. Fresh water sources must also be accounted for in the mitigation design. Freshwater supply can vary dramatically throughout the year in many parts of California. The mitigation design should also consider the beneficial flood control function of a wetland.

9) *Minimize sedimentation*: If excessive sedimentation is a potential problem, then the mitigation plan must include sediment basins and/or maintenance dredging programs to control the build-up of sediments. The plan should encourage the use of upstream sediment controls, including prohibition of grading during the rainy season, stabilization of slopes prior to the rainy season, and protection of native vegetation on steep slopes and stream banks.

10) *Construction timing*: In order to minimize the disturbance to existing wetland habitat, mitigation projects should avoid active periods of reproduction, growth, or migration of wetland species.

### **C. Contents of an Enhancement or Restoration Plan:**

The following list of criteria is intended to assist applicants in preparing an enhancement or restoration plan, and CCC staff in reviewing such plans. At a minimum, an acceptable plan will include:

- 1) Clearly stated objectives and goals consistent with regional habitat goals. These regional goals must identify functions and or habitats most in need of enhancement or restoration and must be as specific as possible. If the regional goals have not been identified, then the applicant and CCC staff should work with relevant federal, State, or local agencies to determine if the proposed plan is consistent with the ecology and natural resource composition of the area.
- 2) Adequate baseline data regarding the biological, physical, and chemical criteria for the mitigation area.
- 3) Documentation that the project will continue to function as a viable wetland over the long term.
- 4) Sufficient technical detail in the project design including, at a minimum, an engineered grading plan and water control structures, methods for conserving or stockpiling topsoil, a planting program including removal of exotic species, a list of all species to be planted, sources of seeds and/or plants, timing of

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cont.

planting, plant locations and elevations on the mitigation site base map, and maintenance techniques.

5) Documentation of performance standards, which provide a mechanism for making adjustments to the mitigation site when it is determined through monitoring, or other means that the enhancement or restoration techniques are not working.

6) Documentation of the necessary management and maintenance requirements, and provisions for remediation should the need arise.

7) An implementation plan that demonstrates there is sufficient scientific expertise, supervision, and financial resources to carry out the proposed activities.

8) A monitoring program (see below for more details).

#### **D. Basic Standards for a Monitoring Plan:**

A monitoring plan is a critical component of an enhancement or restoration plan that provides an objective way to evaluate the success of the project. When properly conducted, monitoring provides invaluable information regarding:

- Assurance that the mitigation project is meeting the stated goals.
- Identification of major problems or flaws in the mitigation area.
- Ways to improve future wetland enhancement or restoration plans.

The monitoring program is intended to document changes in the physical, chemical, and biological status of the mitigation area through the collection and analysis of relevant data. The monitoring plan should include the following components:

1) Provisions for independent monitoring of the site at least five years **after** completion of the mitigation project. The intent is to continue monitoring until the project has successfully met the stated goals and objectives. For larger projects where new wetlands are created, extended monitoring will be required.

2) Repetitive surveys for plants and animals (including species of special concern) throughout the various habitats of the mitigation area. The surveys should use techniques that permit a determination of species composition and abundance. Both terrestrial and aquatic organisms should be surveyed. Timing of the surveys should be considered, since the abundance of many plant and animal species often varies with season. Surveys sufficient to characterize the mitigation site should also be completed **prior** to any enhancement or restoration activities.

3) Monitoring of hydrology. For tidal wetlands this would include a determination of the areas inundated at high and low tide, tidal prism, and water velocity. For non-tidal wetlands, this would include determination of permanent and seasonal patterns of inundation and water sources.

4) Monitoring of water quality. Repetitive sampling of various chemical and physical constituents such as salinity, pH, nutrient concentration, dissolved oxygen, temperature, and turbidity throughout the year. The sampling pattern may vary throughout the year and may include more intensive sampling over several tidal cycles to determine short-term salinity patterns.

5) Monitoring of soil chemistry. This will serve primarily to document trends in soil salinity in tidal wetlands, but may include measurements of other constituents as required.

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6) Ongoing procedures for the identification and correction of problems as they arise. Such problems may be related to the physical, chemical, or biological attributes of the mitigation site, or difficulties in meeting enhancement or restoration objectives and timelines. These procedures should include specific remedies in case the mitigation project does not meet the designated goals.

7) Provisions for timely analysis and production of annual reports. These reports will be distributed to the CCC and other interested parties. The final monitoring report, submitted upon completion of the monitoring program, should analyze all monitoring data and presents different management options.

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### Endnotes

<sup>14</sup>For specific examples see permit numbers 5-90-913, 5-92-408, 5-93-276, 6-86-2, 6-87-611, 6-87-667, 6-88-277, 6-88-388, 6-89-195, 6-90-219, 6-90-77.

<sup>15</sup>For further information on this subject, the reader should consult other published documents, such as *Salt Marsh Restoration* (Zedler, 1984), and *Marsh Restoration in San Francisco Bay: A Guide to Design and Plan* (Josselyn, 1984), and references within.

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# Exhibit C

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EXHIBIT

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# Exhibit C

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*Ecological Applications*, 15(6), 2005, pp. 1906–1914  
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## ECOLOGICAL SUPPORT FOR RURAL LAND-USE PLANNING

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**Abstract.** How can ecologists be more effective in supporting ecologically informed rural land-use planning and policy? Improved decision making about rural lands requires careful consideration of how ecological information and analyses can inform specific planning and policy needs. We provide a brief overview of rural land-use planning, including recently developed approaches to conservation. Effective participation in land-use planning requires ecologists to understand trade-offs—for example, the need to balance a land owner's desire for a fair and predictable process with the “learn as you go” approach of adaptive management—and the importance of integrating local knowledge with landscape-level information.

Four primary challenges require attention from ecologists to improve rural land-use planning. First is the mismatch between the spatial and temporal scales in which ecological processes occur and the scales and tempos of land-use planning. Second, ecologists must engage in interdisciplinary research to critically evaluate and determine how, if, and when ecological information influences rural land-use outcomes. Third, a comprehensive land-use framework is needed to better place ecological studies within a broader landscape context. Finally, ecologists have a key role in developing environmental indicators that directly inform local, rural land-use planning efforts.

**Key words:** *environmental indicators; exurban development; rural land-use planning.*

### INTRODUCTION

Biotic resources throughout North America are threatened by rapid development of landscapes by people, particularly development of private land in rural areas (Theobald and Hobbs 1998, Dale et al. 2000, Hansen et al. 2002, Travis et al. 2002). In the United States, four trajectories of land-use change dominate dynamics in rural landscapes. The first is urbanization. Commercial, industrial, and residential development resulting from regional population and economic growth are extending relentlessly from existing urban centers. Urbanization includes the expansion of suburbs, increased road density, and upgrading of roads and other related infrastructure. The second trajectory is conversion of natural areas to agricultural or intensive forestry. Although the maximum extent of agricultural land peaked in the United States in the 1950s (Theobald 2001), some conversion to agricultural land

use continues. In addition, abandonment of agriculture exposes cropland to forces of natural succession (Bürgli and Turner 2002, Hall et al. 2002). Finally, exurban or rural residential development, including construction of resorts, second-homes, vacation cabins, ranchettes, and farmettes, are perforating landscapes beyond the urban fringe. Exurban development is increasingly stimulated by environmental and recreational amenities (e.g., Ullman 1954, McGranahan 1999) and occurs throughout the United States, particularly on barrier islands in the southeastern United States; around lakes in Michigan, Minnesota, and Wisconsin (Christensen et al. 1996, Schnaiberg et al. 2002); or where private land borders public lands, such as in the Rocky Mountain West (Maestas et al. 2001, Theobald 2001, Hansen et al. 2002) or Southern Appalachians (Wear and Bolstad 1998).

These trajectories form the context of rural land-use decision making in the United States, yet the ecological consequences of land-use changes are rarely considered. Improving access to scientific information could help decision makers anticipate potential consequences of rural land-use change and in so doing, avoid unin-

Manuscript received 17 October 2003; revised 9 February 2005; accepted 10 February 2005; final version received 1 April 2005. Corresponding Editor: M. G. Turner. For reprints of this Invited Feature, see footnote 1, p. 1849.

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tended ecological effects. For example, in response to concerns over forest and farmland loss to development, the State of Oregon enacted the Land Conservation and Development Act in 1973 requiring cities and counties to prepare land-use plans to meet statewide goals (Abbott et al. 1994). Yet, only recently have spatially explicit studies examined how these plans and policies might affect biodiversity or natural ecological processes over time (e.g., Hulse et al. 2004). Given this context, ecologists presume that more information will better inform land-use decision makers regarding the potential ecological consequences of particular land-use plans or actions.

How can ecologists be more effective in supporting rural land-use planning and policy? Our goal in this paper is to offer guidelines about how ecological science can be more effectively applied to support rural land-use planning and policymaking. Rather than attempting a comprehensive review of a nascent field, we summarize typical rural land-use issues, describe a generalized land-use planning framework that forms the context for incorporating ecological information, and identify gaps in ecological research and the practical application of ecological knowledge to rural land-use planning.

#### *Ecological questions associated with rural land-use planning*

Land-use planners and policymakers face a broad range of issues, including provision of affordable housing, schools, water and sewer infrastructure, and emergency services. Ecological questions may also be raised during the planning process, and typical questions ordered roughly from fine to broad scale include:

- 1) How close can houses (or a road) be built near a lake or riparian area without adverse effects?
- 2) If we change land use at a given location, will populations of species *X* decline, and should we be concerned about that decline?
- 3) Where is habitat for Federal/State Threatened and Endangered listed species? Under what land use in the region is the habitat likely to be compromised?
- 4) Given that landowners have different goals for their lands, what opportunities exist to match landowner goals with biodiversity goals?
- 5) Where are high-priority areas of habitat, where are locations that would be suitable for restoration or improvement as part of mitigation?
- 6) What areas are most ecologically unique within our jurisdiction (e.g., county, city, state, etc.)?
- 7) What habitat types are rare regionally and therefore need protection?
- 8) Are there particular places and land cover types that are important to maintain landscape connectivity?
- 9) What are the long-term effects of modification of natural ecological processes (e.g., fire suppression in southwestern US ponderosa pine forests, health of riparian ecosystems due to alteration of hydrologic flow regime, increased proportion of impervious land cover)?
- 10) Do particular land-use changes increase the risk of loss to human settlements and natural resources as a result of natural disturbances or climate change (e.g., flooding and fire)?

Ecologists are particularly concerned over loss and fragmentation of rare species habitat and subsequent declines in populations from land-use changes (e.g., Dale et al. 2000). Less recognized, but perhaps of equal importance in rural areas, are potential conflicts caused by overabundant species. For example, in the West, exurban development often creates "private reserves" where deer and elk congregate safely without being exposed to hunting. Exurban development has been linked with increased prevalence of chronic wasting disease in mule deer (Farnsworth et al. 2005). As a result, spatial concentrations and increased population sizes of wildlife can exacerbate conflict between wildlife and agriculture, complicating management in rural areas experiencing significant exurban development (National Academy of Science, National Research Council 2002). A third concern, gaining resonance with the public, focuses on the consequences of modifying ecological processes such as wildfire and invasive species. Understanding is particularly problematic because it may take decades to centuries to clearly demonstrate the ill or unintended consequences of seemingly successful natural resource policies. Moreover, sometimes management actions that may be outside of the range of natural variability are required to direct a system back into a healthy ecosystem (Allen et al. 2002).

#### *Land-use planning context*

Ecologists must understand the land-use planning context in which ecological information might be used (Clark 1992: Fig. 1). A complex set of laws and policies at federal, state, and local scales regulate natural resources throughout the United States, yet consideration of ecological effects of land-use change does not fit neatly within the traditional federal/state/local government hierarchy (U.S. Government Accountability Office 2004). Although the ecological implications of land-use changes can often be most effectively evaluated at the regional scale, applying this knowledge on the ground presents challenges. In rural areas there is no counterpart to the 377 metropolitan planning organizations (MPOs) that have formed since 1994. These MPOs operate at a regional level as a requirement for spending federal highway funds in urbanized areas (at least 50 000 residents) and have primarily led the development and operation of an integrated, intermodal transportation system to facilitate the efficient,

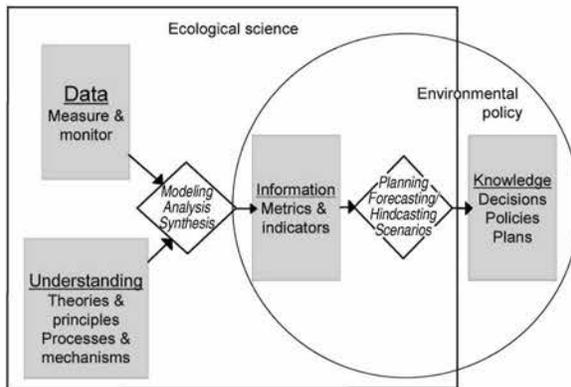


FIG. 1. A framework showing how ecological science develops information used in environmental policy. Ecologists generate data through measurement and monitoring, and use their understanding to convert data to information through process modeling, analysis, and synthesis. Ecological information applied to a study area comes in a variety of forms, often as general landscape metrics and metrics that have been found to be useful by decision makers for a particular purpose—an indicator. Ecologists also participate in the policy realm by developing forecasts from present to future conditions based on policy-relevant assumptions (and hindcasts that simulate past to present). This information is then used by stakeholders, decision makers, and managers to develop policies and plans.

economic movement of people and goods. However, the MPOs do not explicitly address healthy ecosystems in rural areas.

Planners and policymakers often lack high quality, regional-scale information about existing ecological conditions or the potential ecological implications of land-use changes. "In recent years, a general consensus has developed on the need to judge the success of the nation's environmental policies against environmental quality outcomes. . . . The adoption of such a performance-based environmental policy, however, has been hampered by the lack of reliable scientific information on environmental conditions and trends" (U.S. Government Accountability Office 2004:1–2). For example, data were insufficient to support periodic national-level reporting for nearly half (44%) of the 103 indicators developed by the 2002 Heinz Center's State of the Nation's Ecosystems (Heinz Center 2002).

Land-use planning can involve diverse assemblages of public and private landowners, managers, and stakeholders, who must be identified, involved, and empowered if land-use planning processes are to be effective (Wondelleck and Yaffee 2000, Theobald and Hobbs 2002a). Given a potentially large number of stakeholders possessing different views of land use, regional planning necessarily must incorporate diverse land-use goals. This problem is exacerbated as the planning region is enlarged. As a result, ecoregional planning efforts have emerged in the United States and worldwide by nongovernmental organizations such as The Nature

Conservancy and World Wildlife Fund (Groves et al. 2002). Well-focused issues in relatively well-defined geographic areas have a better chance of being addressed in planning and policymaking processes. Yet an institutional gap in planning at the regional level remains—no institution is assigned to conduct ecoregional or cross-ownership planning (Spies et al. 2002).

Despite a longstanding tradition that extends authority for land-use control to local governments (Porter 1997), decisions about land use, both public and private, are often constrained by a potpourri of policies and regulations created by a variety of federal, state, regional, county, and municipal jurisdictions. Land-use planning becomes particularly challenging in situations where intermingled public/private land ownership patterns are included because of the number of agencies, laws, and disparate interest groups involved, but also because relevant planning processes often are uncoordinated. Also, regional social and cultural differences can greatly impact planning outcomes. Different traditions and values span the spectrum from extreme property rights to common property traditions. These differences vary throughout the United States, resulting in a patchwork of federal and state laws, regulations, and policies that influence landscape patterns.

Although all levels of government may possess authority to restrict land use on private lands, ultimately land-use laws and regulations most often are applied at local levels. Each state determines through enabling legislation the extent of planning authority in counties and municipalities. The typical land-use planning structure of local governments involves two distinct processes, both of which can benefit from ecological information (Duerksen et al. 1996). First is the master planning process, which provides a vision for the types of preferred development and directs future land-use changes toward that vision using zoning and other land-use ordinances. Second, the process of development review evaluates individual projects for conformity to existing land-use regulations. Local development plans commonly are reviewed by other branches of government that have greater expertise in evaluating the ecological implications of development projects. However, this ad hoc input is usually advisory to local governments unless public monies are involved invoking federal oversight (e.g., the National Environmental Policy Act, the Endangered Species Act, etc.).

The mismatch of spatial and temporal scale (Fig. 2) underlies perhaps the toughest conundrum ecologists face when informing local land-use decision making: should the future land use of a single property be restricted because of the cumulative effects of past land-use changes on neighboring lands? The aggregate effect of land-use change is the result of many, relatively small individual decisions that are diffuse in space and time, made by a diverse array of planners and policymakers—an ecological form of "the tyranny of small

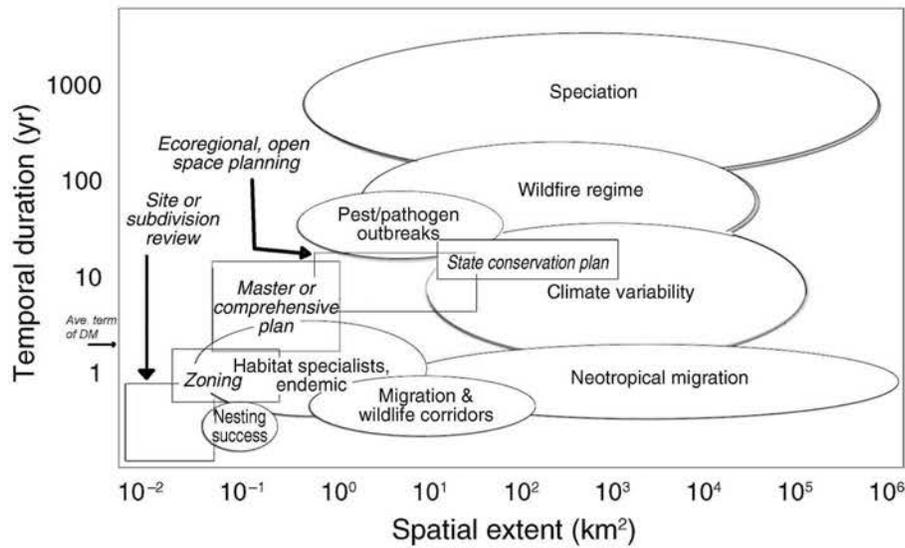


FIG. 2. There is a general mismatch between spatial extent and tempo of ecological processes, shown by ellipses, and local land-use planning activities, shown by rectangles. In particular, note that many ecological processes (such as wildfire regime, migration, disease epidemics, etc.) occur at longer and broader scales. Note that the average term of a local decision maker is approximately two years. The figure is based on Delcourt et al. (1983).

decisions” (Kahn 1966, Odum 1982). It is often difficult to demonstrate that an individual land-use change (~100 ha) may have significant impacts on the long-term viability of a declining species or that would alter broad-scale ecological processes (~10 000 000 ha).

Yet, the cumulative effects of many land-use changes exert demonstrable impacts. For example, consider a hypothetical valley that contains 100 individual properties, each containing critical habitat. It is difficult to demonstrate that the loss of habitat on a single property is significant when a parcel is a small (e.g., 1%) portion of the total habitat, however, it is more likely that the cumulative changes of 50% or 75% of parcels is significant. Ideally ecological science would differentiate the effects of alternative approaches and identify where and when an individual land-use change will cause demonstrable impacts. Currently, ecological science can only identify relative risks of different courses of action or provide expert opinion from scientists based on first principles.

The precautionary principle (Cooney 2004) is occasionally invoked as well, but is unlikely to withstand immediate demands for economic development. An additional concern often expressed as the aphorism “death by a thousand cuts” is raised when only a small proportion of critical habitat is located within any single jurisdictional boundaries (Fig. 3). Differences in the frequency of decisions between agencies that plan land use on publicly vs. privately owned land (e.g., decadal cycle of the National Forests vs. monthly to yearly in counties and municipalities) also can make coordination among multiple planning jurisdictions difficult (G. Wallace, *personal communication*).

Currently, much rural land-use planning is regulatory based (e.g., zoning) and restricts certain land-use activities. However, a number of other incentive-based land-use tools, such as conservation easements, purchasable or transferable development rights, fee-simple

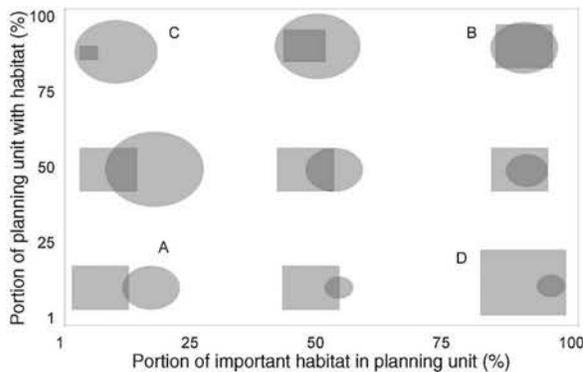


FIG. 3. The relationship of the spatial intersection between the planning unit (e.g., a county, represented by rectangles) and the extent of the important habitat for a given species (represented by ellipses) is critical. In situations where there is little overlap (A), it is difficult to show that land-use actions within the planning unit will likely have an effect (though tyranny of small decisions). As the intersection becomes a larger proportion of both the planning unit and habitat (B), there is a clearer and more direct linkage between land-use actions and the fate of habitat. In the situation where the proportion of the unit is large but is only a small part of the habitat (C), land-use actions will be important but not sufficient—coordination with adjacent and nearby jurisdictions will be required. Conversely, as the habitat becomes fully contained but remains a small proportion within the planning unit, it is easier to carefully plan on setting aside habitat to protect a species.

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purchase, and cluster developments, are receiving renewed attention because they encourage desirable land uses by offering positive incentives to landowners (Theobald and Hobbs 2002b, Hilty and Merenlender 2003). For example, in 2001, over 2.6 million hectares have been protected by local and regional land trusts (Land Trust Alliance 2001). The information needs for strategic protection by land trusts may be different from those of the more standard policy tools, for example development of a certification system for "green development" that awards points based on meeting ecological criteria. Ecologists should be involved in evaluating the efficacy of a full range of policy options. Doing so will require collaboration with economists, political scientists, landscape architects, planners, and other social scientists.

#### *Data integration and communication*

What are the most effective ways to integrate ecological information into rural land-use planning processes? One of the most important ways is through collaboration among stakeholders from federal, state, and local government, and private organizations, groups, and individuals (Theobald and Hobbs 2002a, Cohn and Lerner 2003). As with other forms of collaboration (Likens 1998), significant investment in the process itself is needed to establish credibility and trust among project members. Collaborative planning efforts could be facilitated by expanding traditional roles of regional planning agencies, watershed councils, and extension agents beyond their important educational and integrative roles to empower these groups, perhaps by extending some limited decision making authority to them. Also, it is important to support actively engaged field ecologists with consistent, timely, and pertinent information that complements their local, "in-the-field" experience and knowledge.

A common challenge in efforts to inform land-use planning is to integrate data from a variety of agencies and administrative units into a cohesive, consistent database. Although there are some notable recent efforts to better standardize geographical data, such as the National Spatial Data Infrastructure and the U.S. Geological Survey's Gap Analysis Program, it remains a formidable task to develop and make these data accessible and usable. Further, regional databases are suitable for identifying critical habitat and biodiversity hotspots within a large area (i.e., >1000 ha), but they usually are unsuitable to identify whether a particular landowner's property (i.e., 10 ha) has critical habitat or not. The credibility of projects can be jeopardized without careful consideration of whether the scale of data is sufficient to meet certain stakeholders' expectations.

The ability to customize regional models using "local knowledge" is needed as well. Although ecologists usually come to a land-use decision process as invited experts, the knowledge of local stakeholders must also

play a role that is valued by ecologists. Ranchers, farmers, and public land agency personnel often have tremendous knowledge of the flora, fauna, and traditional use of the natural resources of local areas. This knowledge is often richer than the information provided in typical comprehensive land cover maps. Integrating this knowledge into spatial data and simulation models is critical, both to improve the quality of information produced and to honor the contribution of all stakeholders. Ecological support for rural land-use decisions should be conceived as collaborations that ensure mutual sharing and learning among all parties, rather than the simple transfer of knowledge or technology from experts to decision makers (i.e., yet another "outreach" effort). Ecological support should come from an exchange rather than an export of information.

A number of technological advances provide unparalleled opportunities for using ecological information to inform rural land-use planning. Geospatial technologies such as geographic information systems (GIS) allow spatial data to be collected, integrated, analyzed, and visualized in relation to other environmental and land-use factors. Simulations based on spatially explicit data can be used to examine the consequences of various assumptions on the landscape. The Internet can provide ready access of ecological information to rural land-use decision makers. For example, the Colorado Natural Diversity Information Source (*available online*)<sup>8</sup> was developed to support planning by local communities by providing readily accessible information on the consequences of development for wildlife. It allows planners, decisions makers, and citizens to foresee how cumulative changes in land use over time are likely to affect the extent and distribution of habitat for wildlife (Theobald et al. 2000). Additional opportunities exist through public-participatory research to formalize modes of public interaction with spatial data. For example, visual modeling languages help to explain the logic of models. Interactive "white-board" interfaces to computers offer the potential stakeholders to examine, in real-time, the effect of various assumptions that will more fully engage participants (Nyerges et al. 2002).

Models are particularly useful tools to integrate ecological information and communicate assumptions, potential uncertainties, and the complexity of feedbacks to decision makers (Dale 2003). Throughout the United States, efforts to map alternative future land-use patterns and examine the implications of those changes have been particularly useful and an increasingly common way to integrate ecological information with other socio-economic concerns in long-term, comprehensive planning processes (e.g., White et al. 1997, Wear et al. 1998, Theobald and Hobbs 2002b, Hulse et al. 2004).

<sup>8</sup> ([www.ndis.nrel.colostate.edu](http://www.ndis.nrel.colostate.edu))

Most efforts to date have yet to fully incorporate ecological mechanisms to these assessments, however.

#### *Research and application gaps*

A number of research and application gaps need to be bridged to better inform rural land-use planning. Traditionally, ecologists are inclined to vigorously pursue filling gaps in ecological knowledge. For instance, a principle goal is to understand functional properties of organisms and their relationship to spatial heterogeneity of resources to predict population viability (often related to Endangered Species Act requirements). Synthesis of spatial databases into simulation models is important as well. The foundation of information supporting rural land-use decisions is a high-quality spatial database. To improve these data, we need better mapping of fine-scale landscape features (e.g., tree snags, nests, riparian areas, etc.). Promising new mapping approaches integrate satellite imagery, GIS, and ground plots to estimate fine-scale habitat elements (e.g., Ohmann and Gregory 2002). Although techniques to map land cover using either aerial photos or satellite imagery are improving, mapping land use remains challenging, particularly when mapping rural residential development, where a land-use change often causes only a small footprint which is often invisible (Theobald 2001). Land use can be inferred from land-owner parcel data that are becoming available through local governments, yet even current basic datasets on land ownership (e.g., USFS, BLM, private, easements, etc.) are generally not available. Moreover, detailed information about human activities on public lands (especially recreation) generally is unavailable, and so identifying potential conflicts between biological resources and human activities are difficult.

Progress has been made in developing empirical models and simulation approaches to examine land-use change using broad-scale spatial databases (e.g., Landis 1995, Theobald and Hobbs 1998, Brown et al. 2000, Maxwell et al. 2000, Theobald 2001, Aspinall 2002, Kline et al. 2003); and in examining the ecological effects of these changes (White et al. 1997, Hansen et al. 2002, Theobald 2003). Consideration of the variety of model approaches is needed to understand their utility in different decision making contexts. Most spatial landscape-level models focus on ecological change in forests and ignore climate change, catastrophic events, and vegetation dynamics in non-forested land-use areas. Thus, extant models may apply poorly to many areas of the nation undergoing rapid changes in land use and land cover. Routine integration of socio-economic factors, which largely are responsible for motivating land-use changes, is usually absent from landscape models developed by ecologists. This absence limits the realism of ecological evaluations of alternative policy actions, such as protection of biodiversity (Polasky et al. 2001, Musacchio and Grant 2002). Also,

landscape-level models need to better account for the combined influences of uncertainty and error associated with individual modeling components, in resulting landscape simulations and predictions.

A final gap, one in which ecologists typically have little experience, is in the effective application of ecological knowledge. That is, it is not enough to simply produce useful ecological information in a timely manner, rather it must be carefully incorporated into rural land-use planning through effective communication in the proper decision making processes. This step often requires staff and institutional support to create and run models, help users interpret output, and describe uncertainty and appropriate uses of models to decision makers. Because of the critical need to develop consistent, comprehensive, and credible ecological databases and information delivery tools, a new and important opportunity exists to expand the role of ecologists and existing institutions, or to create new natural resource science institutes that are unaffiliated with advocacy groups.

Ecologists have a timely and important role to assist in the development of environmental indicators that provide decision makers and the public with information to set priorities and assess the efficacies of land-use policies. To ensure the success of indicators, a sound process must be followed to develop indicators, sufficient data must be collected to report status and trends, and changes in indicators must be linked to specific management actions and land-use policies (U.S. Government Accountability Office 2004). A logical next step is to build on the progress of national-level efforts (e.g., Heinz Report) to develop targeted indicators for local planning processes. In particular, there is a need to develop a set of standardized indicators for rural landscapes that have received scientific review, are based on detailed spatial data that resolves fine-scale features (e.g., houses, small wetlands and riparian zones, etc.), and that respond directly to changes in land use (J. Bennett, *personal communication*).

Ecologists who develop integrated models face difficult problems when incorporating data from multiple sources that are characterized by varying degrees of accuracy. To maximize confidence in model output, assumptions and data manipulation for models must be transparent, and where models are used to predict, output should be called forecasting (Clark et al. 2001), projections (Dale and Van Winkle 1998), or scenarios (Schoonenboom 1995). Where possible, models should include the measured variation in data or some assumption about variation (particularly associated with local knowledge) and process outputs as probabilities rather than deterministic responses. Models must clearly portray uncertainty in forecasted outcomes and portray results as best estimates of experts rather than as calculated facts. Evaluation of the effects of alternative land-use scenarios is a useful way to do this (e.g., Stein-

itz 1996, White et al. 1997, Theobald and Hobbs 2002*b*, Hulse et al. 2004).

Future studies should identify successful situations to determine the ways in which ecological information was helpful and to critically examine failures as well. Colleagues from other disciplines, especially political science and sociologists, could assist ecologists in the use and application of ecological information and tools in the rural land-use process. For example, interdisciplinary teams should critically examine whether and when ecological information changed a land-use decision, how it was used by decision makers during deliberation, and what information was missing or how information that was provided could be improved.

### CONCLUSIONS

We believe that ecologists can be more effective in supporting wise decisions on rural land use. To that end, we have offered a brief review of recent ecological work, sketched the typical rural land-use planning framework, and identified some emerging useful approaches to incorporating ecological knowledge in established decision making processes. We are encouraged by an increasing level of awareness and enthusiasm from ecologists for the critical need to improve ecological support for rural land-use planning (e.g., Perlman and Milder 2005). Unfortunately, we have been challenged to find useful examples of truly outstanding or successful projects that have informed rural land-use planning. We do not mean to imply, however, that ecologists are having no influence on rural land-use planning. Rather, we conclude there is a paucity of organized and systematic efforts to evaluate and learn from applied projects.

We believe that four fundamental challenges remain that require additional attention from ecologists. First, there is a mismatch in spatial and temporal scales where ecologists have the greatest understanding and those where land-use decisions occur (Fig. 2). In addition, critical and systematic evaluations of how, if, and when ecological information has influenced land-use outcomes are needed. Ideally, these should be conducted by social scientists to better understand how ecological information is used, how it can be improved, and what different information is needed.

For instance, although NDIS is arguably successful in informing land-use planning with readily available biological information, it remains difficult to provide objective measures of its success. How many land-use decisions have been influenced by NDIS? How many times have NDIS maps been considered during land-use hearings? How many county supervisors, planning and zoning commissioners, or interested citizens have visited the NDIS website? How many students have used NDIS as a source of information for their research projects? Regrettably, we do not have good answers to these questions. Ecologists excel at producing data and

insight, but improving the relevancy and practical application of ecological science requires that ecologists critically evaluate its use and efficacy.

Moreover, standard land-use frameworks used to classify the type of land use (i.e., urban, suburban, agricultural) or the level of stewardship and protection require significant refinement. Negative ecological effects are typically inferred from classes of land use such as high-density residential, commercial, or dry-land agriculture, but more detailed examination and analysis are needed to identify specific, measurable factors of these effects. For instance, are impermeable surfaces, maintenance of exotic species (lawn), modification of vegetation structure (trimming, thinning), etc. the main land cover modifications of high-density residential land use that cause impacts? What activities associated with high-density residential have impacts (e.g., Lepczyk et al. 2004)? Are the major activities that impact ecological systems free-roaming cats and dogs, increased automobile traffic and associated noise, presence of humans? Coarse classes or levels of stewardship (e.g., U.S. Geological Survey's Gap Analysis Project Status I-IV and IUCN's I-VII; Davey 1998) also need to be refined to explicitly examine allowed activities (e.g., active vs. passive recreation) and possible modification of disturbances such as fire suppression or unintended introduction of disturbances from activities such as mechanical thinning.

Finally, a critical component of adaptive management is missing in land-use planning—monitoring and evaluation. For example, a monthly or yearly summary of environmental performance should be assessed using ecological indicators that directly measure land-use decisions. These indicators could include the decrease of critical habitat (or increase through restoration), increase or decline of protected lands, change in air quality due to vehicle miles traveled, etc. Yet, effective participation in land-use planning requires ecologists to understand trade-offs, for example the need to balance a land owner's desire for a fair and predictable process with the "learn as you go" approach of adaptive management. Perhaps most importantly, ecologists must challenge the assumption that simply providing better ecological information and knowledge leads to better land-use planning. Broberg (2003) emphasized the direct roles that ecologists may play (rather than in generating information per se) in the planning process, from less to more direct: generate recommendations while participating in citizen review panels, testify at public hearings, educate staff and planning boards, and become planning board members. Ecologists have a significant and important role in generating and sharing scientific information to decision makers to help anticipate possible unintended ecological effects of rural land-use change.

### ACKNOWLEDGMENTS

The authors thank the anonymous reviewers for helpful comments that have strengthened the focus of this paper. This

work has been supported in part by US EPA STAR Grant R827449-01-0 (to D. M. Theobald and N. T. Hobbs) and the USDA National Research Initiative Award No. 2003-35401-13801 (to D. M. Theobald).

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# Exhibit D

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EXHIBIT

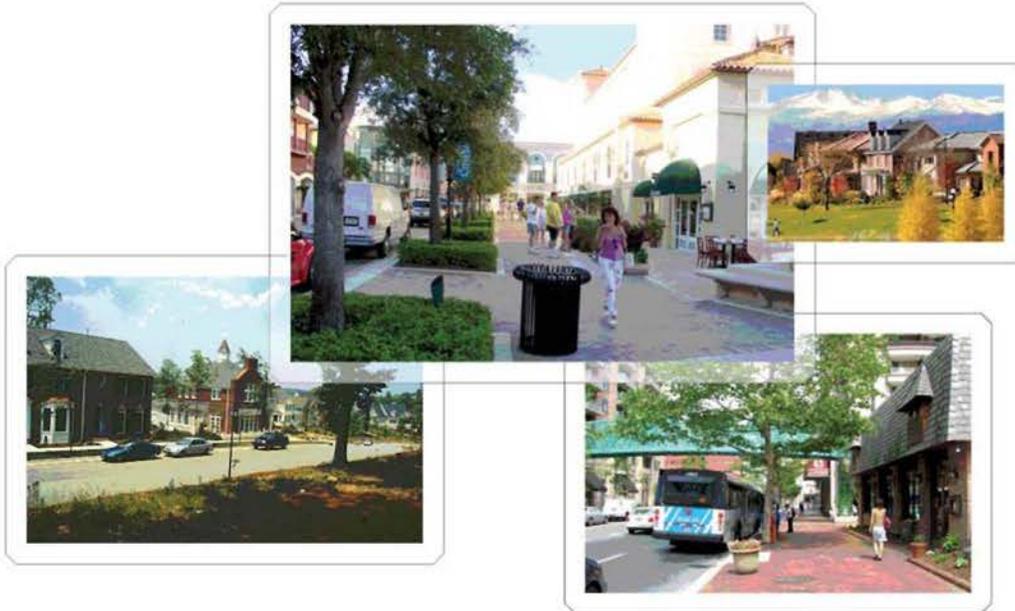
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# Exhibit D

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# Growing Cooler:

## Evidence on Urban Development and Climate Change



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Reid Ewing, Keith Bartholomew, Steve Winkelman,  
Jerry Walters and Don Chen

with Barbara McCann and David Goldberg



## **About ULI**

The mission of the Urban Land Institute is to provide leadership in the responsible use of land and in creating and sustaining thriving communities worldwide. ULI is committed to

- Bringing together leaders from across the fields of real estate and land use policy to exchange best practices and serve community needs;
- Fostering collaboration within and beyond ULI's membership through mentoring, dialogue, and problem solving;
- Exploring issues of urbanization, conservation, regeneration, land use, capital formation, and sustainable development;
- Advancing land use policies and design practices that respect the uniqueness of both built and natural environments;
- Sharing knowledge through education, applied research, publishing, and electronic media; and
- Sustaining a diverse global network of local practice and advisory efforts that address current and future challenges.

Established in 1936, the Institute today has some 38,000 members in over 90 countries, representing the entire spectrum of the land use and development disciplines. ULI relies heavily on the experience of its members. It is through member involvement and information resources that ULI has been able to set standards of excellence in development practice. The Institute has long been recognized as one of the world's most respected and widely quoted sources of objective information on urban planning, growth, and development.

## About the Authors

**Reid Ewing** is a research professor at the National Center for Smart Growth, University of Maryland; an associate editor of the Journal of the American Planning Association; a columnist for Planning magazine; and a fellow of the Urban Land Institute. Earlier in his career, he served two terms in the Arizona legislature, analyzed urban policy issues at the Congressional Budget Office, and lived and worked in Ghana and Iran.

**Keith Bartholomew** is an assistant professor of urban planning in the University of Utah's College of Architecture + Planning. An environmental lawyer, he worked for ten years as the staff attorney for 1000 Friends of Oregon, where he directed "Making the Land Use, Transportation, Air Quality Connection" (LUTRAQ), a nationally recognized research program examining the interactive effects of community development and travel behavior.

**Steve Winkelman** is director of the Transportation Program at the Center for Clean Air Policy (CCAP). He coordinated transportation analyses of climate change plans for New York and several other states, culminating in the CCAP Transportation Emissions Guidebook, which quantifies savings from 40 transportation policies. In February 2007 Steve launched a national discussion, "Linking Green-TEA and Climate Policy," to craft policy solutions that address travel demand.

**Jerry Walters** is a principal and chief technical officer with Fehr & Peers Associates, a California-based transportation planning and engineering firm. He directs integrated land use/transportation research and planning for public entities and real estate development interests throughout the United States and abroad.

**Don Chen** is the founder and executive director of Smart Growth America (SGA) and has worked for the Surface Transportation Policy Project, the World Resources Institute, and the Rocky Mountain Institute. He has been featured in numerous news programs and publications; has lectured in North America, Europe, Australia, and Asia; and has written for many magazines and journals, including "The Science of Smart Growth" for Scientific American.

# Executive Summary

The phrase “you can’t get there from here” has a new application. For climate stabilization, a commonly accepted target would require the United States to cut its carbon dioxide (CO<sub>2</sub>) emissions by 60 to 80 percent as of 2050, relative to 1990 levels. Carbon dioxide levels have been increasing rapidly since 1990, and so would have to level off and decline even more rapidly to reach this target level by 2050. This publication demonstrates that the U.S. transportation sector cannot do its fair share to meet this target through vehicle and fuel technology alone. We have to find a way to sharply reduce the growth in vehicle miles driven across the nation’s sprawling urban areas, reversing trends that go back decades.

This publication is based on an exhaustive review of existing research on the relationship between urban development, travel, and the CO<sub>2</sub> emitted by motor vehicles. It provides evidence on and insights into how much transportation-related CO<sub>2</sub> savings can be expected with compact development, how compact development is likely to be received by consumers, and what policy changes will make compact development possible. Several related issues are not fully examined in this publication. These include the energy savings from more efficient building types, the value of preserved forests as carbon sinks, and the effectiveness of pricing strategies—such as tolls, parking charges, and mileage-based fees—when used in conjunction with compact development and expanded transportation alternatives.

The term “compact development” does not imply high-rise or even uniformly high density, but rather higher average “blended” densities. Compact development also features a mix of land uses, development of strong population and employment centers, interconnection of streets, and the design of structures and spaces at a human scale.

## The Basics

Scientific consensus now exists that greenhouse gas accumulations due to human activities are contributing to global warming with potentially catastrophic consequences (IPCC 2007). International and domestic climate policy discussions have gravitated toward the goal of limiting the temperature increase to 2°C to 3°C by cutting greenhouse gas emissions by 60 to 80 percent below 1990 levels by the year 2050. The primary greenhouse gas is carbon dioxide, and every gallon of gasoline burned produces about 20 pounds of CO<sub>2</sub> emissions.

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## Driving Up CO<sub>2</sub> Emissions

The United States is the largest emitter worldwide of the greenhouse gases that cause global warming. Transportation accounts for a full third of CO<sub>2</sub> emissions in the United States, and that share is growing as others shrink in comparison, rising from 31 percent in 1990 to 33 percent today. It is hard to envision a “solution” to the global warming crisis that does not involve slowing the growth of transportation CO<sub>2</sub> emissions in the United States.

## The Three-Legged Stool Needed to Reduce CO<sub>2</sub> from Automobiles

Transportation CO<sub>2</sub> reduction can be viewed as a three-legged stool, with one leg related to vehicle fuel efficiency, a second to the carbon content of the fuel itself, and a third to the amount of driving or vehicle miles traveled (VMT). Energy and climate policy initiatives at the federal and state levels have pinned their hopes almost exclusively on shoring up the first two legs of the stool, through the development of more efficient vehicles (such as hybrid cars) and lower-carbon fuels (such as biodiesel fuel). Yet a stool cannot stand on only two legs.

As the research compiled in this publication makes clear, technological improvement in vehicles and fuels are likely to be offset by continuing, robust growth in VMT. Since 1980, the number of miles Americans drive has grown three times faster than the U.S. population, and almost twice as fast as vehicle registrations (see Figure 0-1). Average automobile commute times in metropolitan areas have risen steadily over the decades, and many Americans now spend more time commuting than they do vacationing.

This raises some questions, which this report addresses. Why do we drive so much? Why is the total distance we drive growing so rapidly? And what can be done to alter this trend in a manner that is effective, fair, and economically acceptable?

The growth in driving is due in large part to urban development, or what some refer to as the built environment. Americans drive so much because we have given ourselves little alternative. For 60 years, we have built homes ever farther from workplaces, created schools that are inaccessible except by motor vehicle, and isolated other destinations—such as shopping—from work and home. From World War II until very recently, nearly all new development has been planned and built on the assumption that people will use cars virtually every time they travel. As a larger and larger share of our built environment has become automobile dependent,

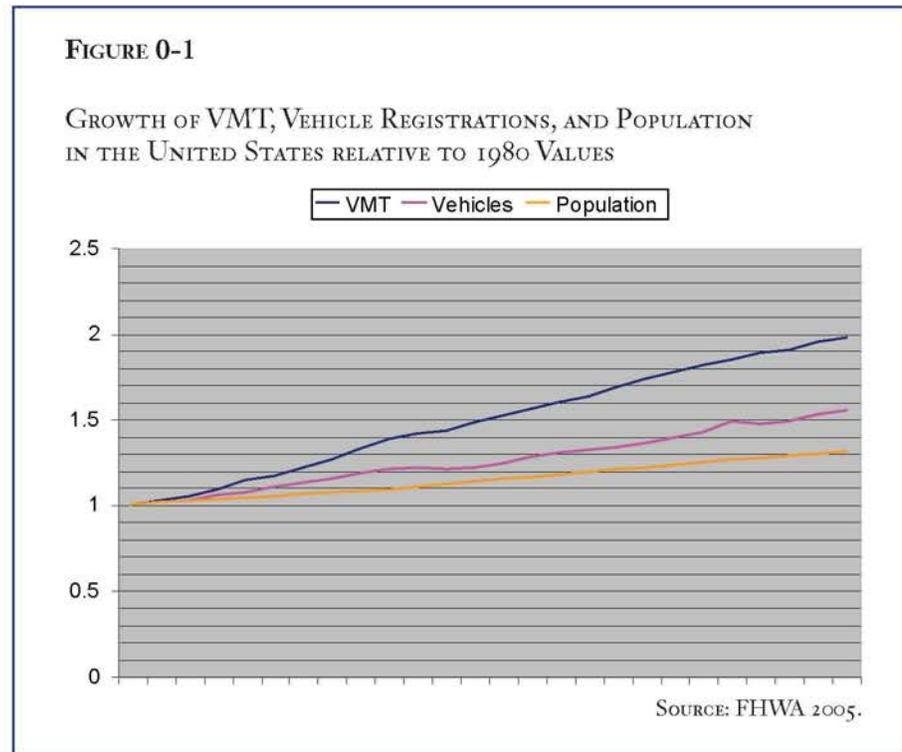
car trips and distances have increased, and walking and public transit use have declined. Population growth has been responsible for only a quarter of the increase in vehicle miles driven over the last couple of decades. A larger share of the increase can be traced to the effects of a changing urban environment, namely to longer trips and people driving alone.

As with driving, land is being consumed for development at a rate almost three times faster than population growth. This expansive development has caused CO<sub>2</sub> emissions from cars to rise even as it has reduced the amount of forest land available to absorb CO<sub>2</sub>.

### How Growth in Driving Cancels Out Improved Vehicle Fuel Economy

Carbon dioxide is more difficult to control through vehicle technology than are conventional air pollutants. Conventional pollutants can be reduced in automobile exhaust with sophisticated emission control systems (catalytic converters, on-board computers, and oxygen sensors). Carbon dioxide, meanwhile, is a direct outcome of burning fossil fuels; there is no practical way to remove or capture it from moving vehicles. At this point in time, the only way to reduce CO<sub>2</sub> emissions from vehicles is to burn less gasoline and diesel fuel.

An analysis by Steve Winkelman of the Center for Clean Air Policy, one of the coauthors of this publication,

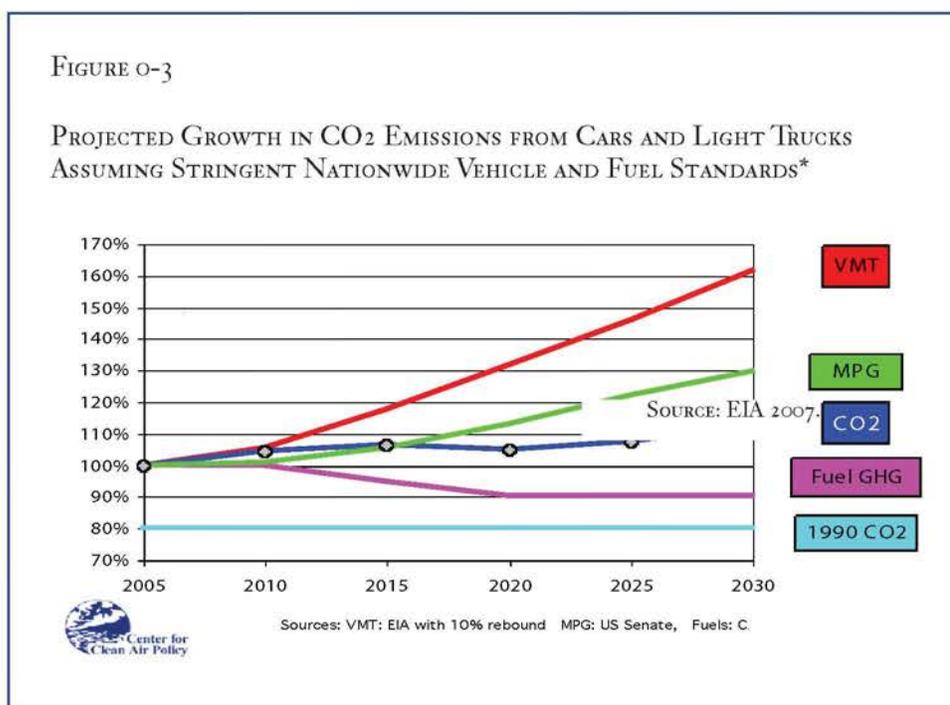
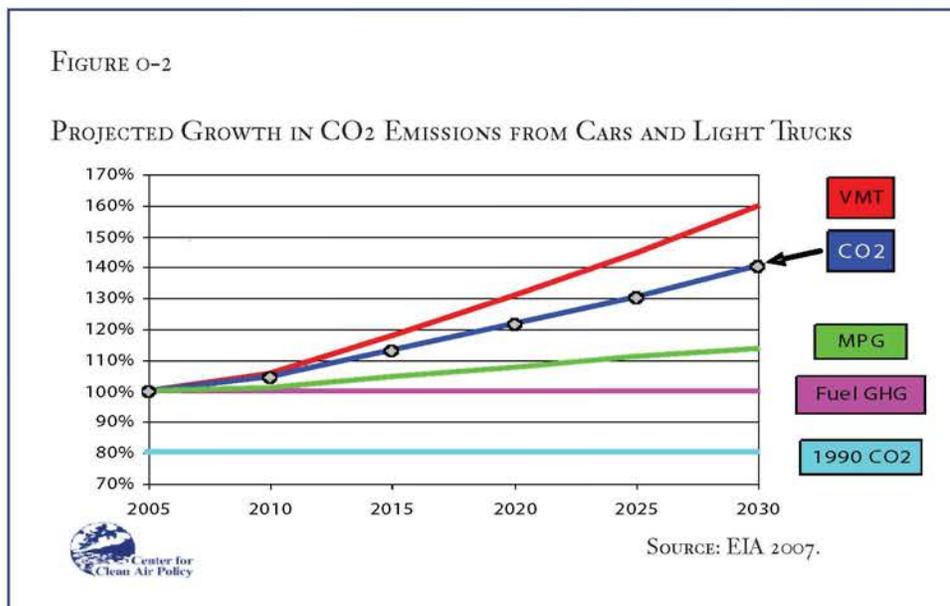


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finds that CO<sub>2</sub> emissions will continue to rise, despite technological advances, as the growth in driving overwhelms planned improvements in vehicle efficiency and fuel carbon content. The U.S. Department of Energy's Energy Information Administration (EIA) forecasts that driving will increase 59 percent between 2005 and 2030 (red line, Figure 0-2), outpacing the projected 23 percent increase in population. The EIA also forecasts a fleetwide fuel economy improvement of 12 percent within this time frame, primarily as a result of new federal fuel economy standards for light trucks (green line, Figure 0-2). Despite this improvement in efficiency, CO<sub>2</sub> emissions would grow by 41 percent (dark blue line, Figure 0-2).

U.S. fuel economy has been flat for almost 15 years, as the upward spiral of car weight and power has offset the more efficient technology. Federal and state efforts are underway to considerably boost vehicle efficiency and reduce greenhouse gas emissions. In June 2007, the U.S. Senate passed corporate average fuel economy (CAFE) standards that would increase new passenger vehicle fuel economy from the current 25 miles per gallon (mpg) to 35 mpg by 2020. (As of this writing, the House has not acted.). California plans to implement a low carbon standard for transportation fuels, specifically a 10 percent reduction in fuel carbon content by 2020.

Even if these more stringent standards for vehicles and fuels were to go into effect nationwide, transportation-related emissions would still far exceed target levels for stabilizing the global climate (see Figure 0-3). The rapid increase in driving would overwhelm both the increase in vehicle fuel economy (green line) and the lower carbon fuel content (purple line). In 2030, CO<sub>2</sub> emissions would be 12 percent above the 2005 level, and 40 percent above the 1990 level



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(turquoise line). For climate stabilization, the United States must bring the CO<sub>2</sub> level to 15 to 30 percent below 1990 levels by 2020 to keep in play a CO<sub>2</sub> reduction of 60 to 80 percent by 2050.

As the projections show, the United States cannot achieve such large reductions in transportation-related CO<sub>2</sub> emissions without sharply reducing the growth in miles driven.

## Changing Development Patterns to Slow Global Warming

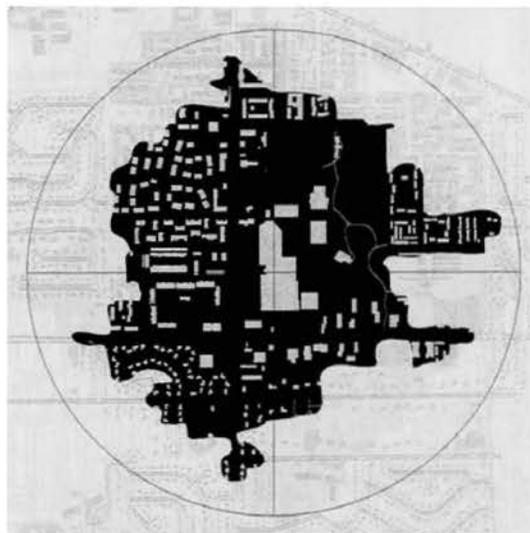
Recognizing the unsustainable growth in driving, the American Association of State Highway and Transportation Officials (AASHTO), representing state departments of transportation, is urging that the growth of vehicle miles driven be cut in half. How does a growing country—one with 300 million residents and another 100 million on the way by mid-century—slow the growth of vehicle miles driven? Aggressive measures certainly are available, including imposing ever stiffer fees and taxes on driving and parking or establishing no-drive zones or days. Some countries are experimenting with such measures. However, many in this country would view such steps as punitive, given the reality that most Americans do not have a viable alternative to driving. The body of research surveyed here shows that much of the rise in vehicle emissions can be curbed simply by growing in a way that will make it easier for Americans to drive less. In fact, the weight of the evidence shows that, with more compact development, people drive 20 to 40 percent less, at minimal or reduced cost, while reaping other fiscal and health benefits.

### How Compact Development Helps Reduce the Need to Drive

Better community planning and more compact development help people live within walking or bicycling distance of some of the destinations they need to get to every day—work, shops, schools, and parks, as well as transit stops. If they choose to use a car, trips are short. Rather than building single-use subdivisions or office parks, communities can plan mixed-use developments that put housing within reach of these other destinations. The street network can be designed to interconnect, rather than end in culs-de-sac and funnel traffic onto overused arterial roads. Individual streets can be designed to be “complete,” with safe and convenient places to walk, bicycle, and wait for the bus. Finally, by building more homes as condominiums, townhouses, or detached houses on smaller lots, and by building offices, stores and other destinations “up” rather than “out,” communities can shorten distances between destinations. This makes neighborhood stores more economically viable, allows more frequent and convenient transit service, and helps shorten car trips.

FIGURE O-4

DESTINATIONS WITHIN ONE-QUARTER MILE OF CENTER FOR CONTRASTING STREET NETWORKS IN SEATTLE



SOURCE: MOUDON ET AL. 1997.

This type of development has seen a resurgence in recent years, and goes by many names, including “walkable communities,” “new urbanist neighborhoods,” and “transit-oriented developments” (TODs). “Infill” and “brownfield” developments put unused lots in urban areas to new uses, taking advantage of existing nearby destinations and infrastructure. Some “lifestyle centers” are now replacing single-use shopping malls with open-air shopping on connected streets with housing and office space as part of the new development. And many communities have rediscovered and revitalized their traditional town centers and downtowns, often adding more housing to the mix. These varied development types are collectively referred to in this publication as “compact development” or “smart growth.”

## How We Know that Compact Development Will Make a Difference: The Evidence

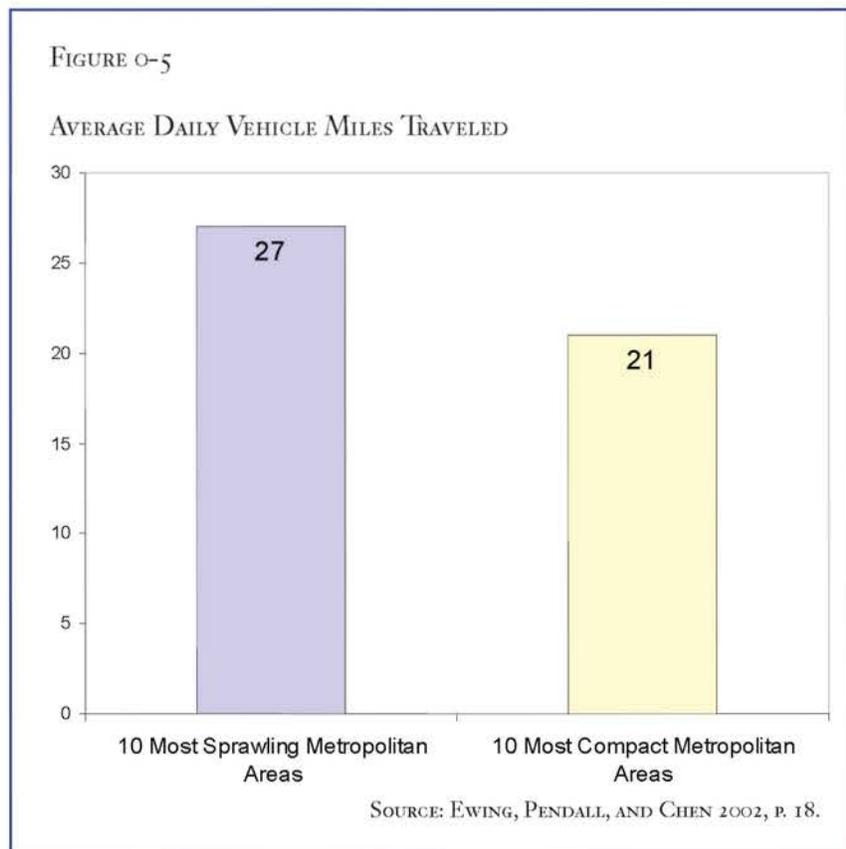
As these forms of development have become more common, planning researchers and practitioners have documented that residents of compact, mixed-use, transit-served communities do less driving. Studies have looked at the issue from varying angles, including:

- research that compares overall travel patterns among regions and neighborhoods of varying compactness and auto orientation;
- studies that follow the travel behavior of individual households in various settings; and
- models that simulate and compare the effects on travel of different future development scenarios at the regional and project levels.

Regardless of the approach, researchers have found significant potential for compact development to reduce the miles that residents drive.

A comprehensive sprawl index developed by coauthor Reid Ewing of the National Center for Smart Growth at the University of Maryland ranked 83 of the largest metropolitan areas in the United States by their degree of sprawl, measuring density, mix of land uses, strength of activity centers, and connectedness of the street network (Ewing, Pendall, and Chen 2002, 2003). Even accounting for income and other socioeconomic differences, residents drove far less in the more compact regions. In highly sprawling Atlanta, vehicles racked up 34 miles each day for every person living in the region. Toward the other end of the scale, in Portland, Oregon, vehicles were driven fewer than 24 miles per person, per day.

This relationship holds up in studies that focus on the travel habits of individual households while measuring the environment surrounding their



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homes and/or workplaces. The link between urban development patterns and individual or household travel has become the most heavily researched subject in urban planning, with more than 100 rigorous empirical studies completed. These studies have been able to control for factors such as socioeconomic status, and can account for the fact that higher-income households tend to make more and longer trips than lower-income families.

One of the most comprehensive studies, conducted in King County, Washington, by Larry Frank of the University of British Columbia, found that residents of the most walkable neighborhoods drive 26 percent fewer miles per day than those living in the most sprawling areas. A meta-analysis of many of these types of studies finds that households living in developments with twice the density, diversity of uses, accessible destinations, and interconnected streets when compared to low-density sprawl drive about 33 percent less.

Many studies have been conducted by or in partnership with public health researchers interested in how the built environment can be better designed to encourage daily physical activity. These studies show that residents of communities designed to be walkable both drive fewer miles and also take more trips by foot and bicycle, which improves individual health. A recent literature review found that 17 of 20 studies, all dating from 2002 or later, have established statistically significant relationships between some aspect of the built environment and the risk of obesity.

Two other types of studies also find relationships between development patterns and driving: simulations that project the effect of various growth options for entire regions and simulations that predict the impact of individual development projects when sited and designed in different ways. In regional growth simulations, planners compare the effect of a metropolitan-wide business-as-usual scenario with more compact growth options. Coauthor Keith Bartholomew of the University of Utah analyzed 23 of these studies and found that compact scenarios averaged 8 percent fewer total miles driven than business-as-usual ones, with a maximum reduction of 31.7 percent (Bartholomew 2005, 2007). The better-performing scenarios were those with higher degrees of land use mixing, infill development, and population density, as well as a larger amount of expected growth. The travel models used in these studies would be expected to underestimate the impacts of site design, since most only crudely account for travel within neighborhoods and disregard walk and bike trips entirely.

Of the project-level studies, one of the best known evaluated the impact of building a very dense, mixed-use development at an abandoned steel mill site in the heart of Atlanta versus spreading the equivalent amount of commercial space and number of housing units in the prevailing patterns at three suburban locations. Analysis using transportation models enhanced by coauthor Jerry Walters of Fehr & Peers Associates (Walters, Ewing, and Allen 2000), and supplemented by the EPA's Smart Growth Index (to capture the effects of site design) found that the infill location would generate about 35 percent less driving and emissions than the comparison sites. The results were so compelling that the development was deemed a transportation control measure by the federal government for the purpose of helping to improve the region's air quality. The Atlantic Station project has become a highly successful reuse of central city industrial land.

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cont.**

## What Smart Growth Would Look Like

How would this new focus on compact development change U.S. communities? Many more developments would look like the transit-oriented developments and new urbanist neighborhoods already going up in almost every city in the country, and these developments would start filling in vacant lots or failing strip shopping centers, or would revitalize older town centers, rather than replacing forests or farmland. Most developments would no longer be single-use subdivisions or office parks, but would mix shops, schools, and offices together with homes. They might feature ground-floor stores and offices with living space above, or townhomes within walking distance of a retail center. Most developments would be built to connect seamlessly with the external street network.



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ATLANTIC STATION TODAY.

The density increases required to achieve the changes proposed in this publication would be moderate. Nelson's work shows that the average density of residential development in U.S. urban areas was about 7.6 units per acre in 2003. His predictions of shifting market demand indicate that all housing growth to 2025 could be accommodated by building condominiums, apartments, townhomes, and detached houses on small lots, while maintaining the current stock of houses on large lots. Under this scenario, while new developments would average a density of 13 units per acre, the average density of metropolitan areas overall would rise modestly, to about nine units per acre. Much of the change would result from stopping the sprawling development that has resulted in falling densities in many metropolitan areas.

Several publications provide a glimpse of what this future might look like. Images of compact development are available in *This is Smart Growth* (Smart Growth Network 2006) and *Visualizing Density* (Lincoln Institute of Land Policy 2007).

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## The Potential of Smart Growth

The potential of smart growth to curb the rise in greenhouse gas emissions will, of course, be limited by the amount of new development and redevelopment that takes place over the next few decades, and by the share of it that is compact in nature. There seems to be little question that a great deal of new building will take place as the U.S. population grows toward 400 million. According to the best available analysis, by Chris Nelson of Virginia Tech, 89 million new or replaced homes—and 190 billion square feet of new offices, institutions, stores, and other nonresidential buildings—will be constructed through 2050. If that is so, two-thirds of the development on the ground in 2050 will be built between now and then. Pursuing smart growth is a low-cost climate change strategy, because it involves shifting investments that have to be made anyway.

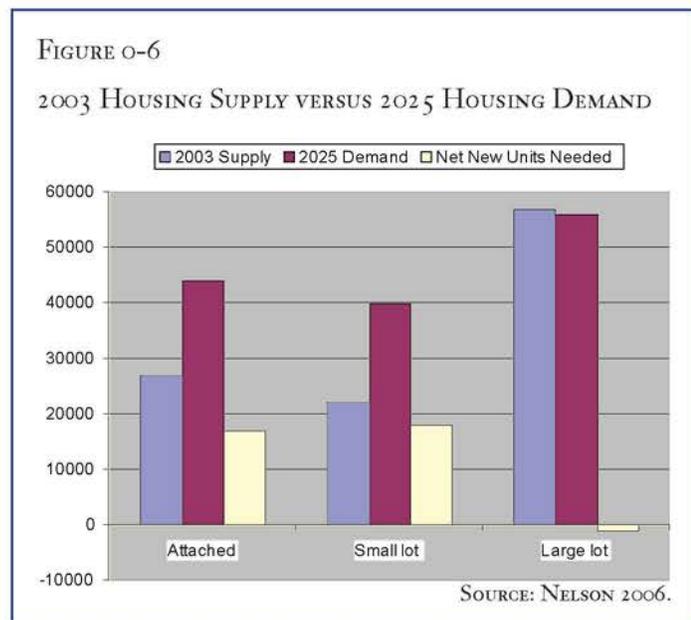
### Smart Growth Meets Growing Market Demand for Choice

There is no doubt that moving away from a fossil fuel-based economy will require many difficult changes. Fortunately, smart growth is a change that many Americans will embrace. Evidence abounds that Americans are demanding more choices in where and how they live—and that changing demographics will accelerate that demand.

While prevailing zoning and development practices typically make sprawling development easier to build, developers who make the effort to create compact communities are encountering a responsive public. In 2003, for the first time in the country's history, the sales prices per square foot for attached housing—that is, condominiums and townhouses—was higher than that of detached housing units. The real estate analysis firm Robert Charles Lesser & Co. has conducted a dozen consumer preference surveys in suburban and urban locations<sup>1</sup> for a variety of builders to help them develop new projects. The surveys have found that in every location examined, about one-third of respondents prefer smart growth housing products and communities. Other studies by the National Association of Homebuilders, the National Association of Realtors, the Fannie Mae Foundation, high-production builders, and other researchers have corroborated these results—some estimating even greater demand for smart growth housing products. When smart growth also offers shorter commutes, it appeals to another one-quarter of the market, because many people are willing to trade lot or house size for shorter commutes.

Because the demand is greater than the current supply, the price-per-square foot values of houses in mixed-use neighborhoods show price premiums ranging from 40 to 100 percent, compared to houses in nearby single-use subdivisions, according to a study by Chris Leinberger of the Brookings Institution.

This market demand is only expected to grow over the next several decades, as the share of households with children shrinks and those made up of older Americans grows with the retiring of baby boomers. Households without children will account for close to 90 percent of new housing demand, and single-person households will account for a one-third. Nelson projects that the demand for attached and small-lot housing will exceed the current supply by 35 million units (71 percent), while the demand for large-lot housing will actually be less than the current supply.



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<sup>1</sup> These locations include Albuquerque, Atlanta, Boise, Charlotte, Chattanooga, Denver, Orlando, Phoenix, Provo, Savannah, and Tampa.

## Total Estimated VMT Reduction and Total Climate Impact

When viewed in total, the evidence on land use and driving shows that compact development will reduce the need to drive between 20 and 40 percent, as compared with development on the outer suburban edge with isolated homes, workplaces, and other destinations. It is realistic to assume a 30 percent cut in VMT with compact development.

Making reasonable assumptions about growth rates, the market share of compact development, and the relationship between CO<sub>2</sub> reduction and VMT reduction, smart growth could, by itself, reduce total transportation-related CO<sub>2</sub> emissions from current trends by 7 to 10 percent as of 2050. This reduction is achievable with land-use changes alone. It does not include additional reductions from complementary measures, such as higher fuel prices and carbon taxes, peak-period road tolls, pay-as-you drive insurance, paid parking, and other policies designed to make drivers pay more of the full social costs of auto use.

This estimate also does not include the energy saved in buildings with compact development, or the CO<sub>2</sub>-absorbing capacity of forests preserved by compact development. Whatever the total savings, it is important to remember that land use changes provide a permanent climate benefit that would compound over time. The second 50 years of smart growth would build on the base reduction from the first 50 years, and so on into the future. More immediate strategies, such as gas tax increases, do not have this degree of permanence.

The authors calculate that shifting 60 percent of new growth to compact patterns would save 85 million metric tons of CO<sub>2</sub> annually by 2030. The savings over that period equate to a 28 percent increase in federal vehicle efficiency standards by 2020 (to 32 mpg), comparable to proposals now being debated in Congress. It would be as if the fleetwide efficiency for new vehicles had risen to 32 mpg by 2020. Every resident of a compact neighborhood would provide the environmental benefit expected from, say, driving one of today's efficient hybrid cars. That effect would be compounded, of course, if that person also drove such an efficient car whenever he or she chose to make a vehicle trip. Smart growth would become an important "third leg" in the transportation sector's fight against global warming, along with more efficient vehicles and lower-carbon fuels.

## A Climate-Sparing Strategy with Multiple Payoffs

Addressing climate change through smart growth is an attractive strategy because, in addition to being in line with market demand, compact development provides many other benefits and will cost the economy little or nothing. Research has documented that compact development helps preserve farmland and open space, protect water quality, and improve health by providing more opportunities for physical activity.

Studies also have confirmed that compact development saves taxpayers money, particularly by reducing the costs of infrastructure such as roads and water and sewer lines. For example, the Envision Utah scenario planning process resulted in the selection of a compact growth plan that will save the region about \$4.5 billion in infrastructure spending over a continuation of sprawling development.

Finally, unlike hydrogen-fueled vehicles and cellulosic ethanol, which get a lot of attention in the climate-change debate, the "technology" of compact, walkable communities exists today, as it has in one form or another for thousands of years. We can begin using this technology in the service of a cooler planet right now.

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## Policy Implications

In most metropolitan areas, compact development faces an uneven playing field. Local land development codes encourage auto-oriented development. Public spending supports development at the **metropolitan** fringe more than in already developed areas. Transportation policies remain focused on accommodating the automobile rather than alternatives.

The key to substantial GHG reductions is to get all policies, funding, incentives, practices, rules, codes, and regulations pointing in the same direction to create the right conditions for smart growth. Innovative policies often are in direct conflict with the conventional paradigm that produces automobile dependence.

Here, we three major policy initiatives at the federal level that would benefit states, metro regions, cities and towns in their efforts to meet the growing demand for compact development. These initiatives, as well as potential actions on the part of state and local governments, discussed more fully in Chapter 7 of *Growing Cooler*.

### Federal Actions

**Require Transportation Conformity for Greenhouse Gases.** Federal climate change legislation should require regional transportation plans to pass a conformity test for CO<sub>2</sub> emissions, similar to those for other criteria pollutants. The Supreme Court ruling in *Massachusetts v. EPA* established the formal authority to consider greenhouse gases under the Clean Air Act, and a transportation planning conformity requirement would be an obvious way for the EPA to exercise this authority to produce tangible results.

**Enact “Green-TEA” Transportation Legislation that Reduces GHGs.** The Intermodal Surface Transportation Efficiency Act of 1991 (known as ISTEA) represented a revolutionary break from past highway bills with its greater emphasis on alternatives to the automobile, community involvement, environmental goals, and coordinated planning. The next surface transportation bill could bring yet another paradigm shift; it could further address environmental performance, climate protection, and green development. We refer to this opportunity as “Green-TEA.”

**Provide Funding Directly to Metropolitan Planning Organizations (MPOs).** Metropolitan areas contain more than 80 percent of the nation’s population and 85 percent of its economic output. Investment by state departments of transportation in metropolitan areas lags far behind these percentages. The issue is not just the amount of funding; it is also the authority to decide how the money is spent. What is necessary to remedy the long history of structural and institutional causes of these inequities is a new system of allocating federal transportation funds directly to metropolitan areas. The amount of allocation should be closer to the proportion of an MPO’s population and economic activity compared to other MPOs and non-MPO areas in the same state.

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# Exhibit E

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# Fact Sheet

## PM<sub>2.5</sub> Designations under the Clean Air Act

### Common Sources of PM<sub>2.5</sub>

#### Woodstoves



Photo Credit: WA Dept. of Ecology

Woodstoves are a primary source of PM<sub>2.5</sub>, especially when wood is burned improperly or in uncertified devices. Control measures include public education for proper burning and woodstove changeout programs to replace outdated stoves.

#### Garbage & Open Burning



Burning trash is a dangerous and localized source of PM<sub>2.5</sub> which is especially dangerous to elders, children, pregnant women and people with respiratory or heart disease. Control measures include recycling and safe disposal of waste in a landfill.

#### Field, Forest & Rangeland Burning



Photo credit: Nez Perce Tribe

Large scale burns are major sources of PM<sub>2.5</sub>, especially in areas where air pollution is trapped by topography or weather conditions. Control measures include airshed-wide monitoring for PM<sub>2.5</sub>, phased burns, burn bans or "no burn" days, burn permits and other methods to ensure air quality conditions allow burning.

#### Mobile Sources / Diesel



Emissions from mobile sources such as cars trucks, tractors and train engines are significant sources of particulate matter and air toxics. Control measures include diesel retrofits, use of low sulfur fuel and educational outreach campaigns to encourage less driving and idling.

#### Stationary Sources



Industrial activities are an additional source of PM<sub>2.5</sub>, but actually are a smaller contributor to high PM<sub>2.5</sub> levels across Region 10 compared with woodsmoke or field or forest burning.

### What is PM<sub>2.5</sub>?

PM<sub>2.5</sub> is particulate matter less than 2.5 microns in diameter composed of very small bits of ash, wood tars, soot and other substances created by combustion. To give you a sense for how tiny this is, the period at the end of this sentence is about 500 microns across. PM<sub>2.5</sub> particles are so small that they can evade the body's natural defense mechanisms and penetrate deep into lung tissue. The PM<sub>2.5</sub> particles can damage lung tissue, which can lead to serious respiratory problems. In 2006, EPA lowered the 24-hour fine particle standard from 65 micrograms per cubic meter (µg/m<sup>3</sup>) to 35 µg/m<sup>3</sup> to provide greater protection to public health from exposure to fine particles.

### What are important sources of PM<sub>2.5</sub> in the Northwest and Alaska?

During the winter, when PM<sub>2.5</sub> levels are highest, key contributors in the Northwest and Alaska include burning of wood in woodstoves and fireplaces. During the summer, spring and fall, open burning, which has long been used as a waste disposal practice and as a management tool for croplands, rangelands, and forests, is a key source of PM<sub>2.5</sub>. In addition, mobile sources and stationary sources can contribute to PM<sub>2.5</sub> levels.

### What are PM<sub>2.5</sub> designations?

When EPA revises a standard, we are then required to designate all geographic areas within the United States as attainment, unclassifiable, or nonattainment under Section 107 of the Clean Air Act (CAA). Designating an area under the CAA is accomplished through a formal rulemaking process outlined in Section 107(d) of the Act. If an area does not meet the national standard for PM<sub>2.5</sub>, an area will be designated as nonattainment. Attainment areas are areas that meet the standard, and unclassifiable areas are areas that cannot be classified on the basis of available information as meeting or not meeting the standard.

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### ***Which areas are subject to EPA's designations?***

EPA will be making designations for all areas in the country, both for state lands and for Indian country. Under the process set out in the Clean Air Act, only states are required to submit recommendations for designations to EPA December 18, 2007.

### ***How can tribes participate in the designations process?***

Unlike states, tribes are not obligated to submit designation recommendations but are invited to participate in the designations process by submitting a designation recommendation for Indian country and/or by engaging in formal or informal consultation with EPA and states. Tribal consultation is important part of the designations process. Through consultation EPA can gather important information from tribes about designations of areas in Indian country or adjacent state land. Tribes can also through consultation, learn about state plans to prepare their recommendations for designation of lands which may surround Indian country.

### ***What is the timeline for PM<sub>2.5</sub> designations?***

**December 18, 2006** - PM<sub>2.5</sub> standard strengthened.

**Summer 2007** – EPA sends letters to states/tribes asking for designation recommendations and inviting consultation.

**December 18, 2007** – States' designation recommendations are due to EPA. Tribes requested to send by this date.

**August 2008** – EPA will send letters to states/tribes announcing whether or not we agree with their designation recommendations and to all areas that did not send letters announcing our proposed designation for their area.

**August/Sept 2008** – EPA will open a 30 day public comment period on EPA's response to states/tribes recommendations.

**December 18, 2008** – By this date EPA will issue final designations for all areas.

**March 2012** - State attainment plans are due for state areas designated as nonattainment for PM<sub>2.5</sub>.

### ***What are the requirements for state or tribal areas that have been designated unclassifiable for PM<sub>2.5</sub> ?***

An unclassifiable designation does not trigger any additional requirements for states/tribes. Existing requirements (Prevention of Significant Deterioration, FARR, etc.) do not change as a result of this designation.

### ***What are the requirements for state or tribal areas that have been designated attainment?***

An attainment designation does not trigger any additional requirements for states/tribes. Existing requirements (Prevention of Significant Deterioration, FARR, etc.) do not change as a result of this designation.

### ***What are the requirements for state or tribal areas that have been designated nonattainment?***

States with nonattainment areas are required to develop and submit plans to show how they will attain the PM<sub>2.5</sub> standard as expeditiously as possible. These plans are referred to as State Implementation Plans or SIPs. These plans are due in 2012 and should contain regulations and technical justification for how those regulations will result in attainment in the future. In addition, states are required to meet the standard within 5-10 years of the submittal of the attainment plan (or attainment SIP). Tribes with areas of Indian country adjacent to state nonattainment areas should work with states as they develop these plans. Tribes with nonattainment areas are not required to follow a specific timeline for submitting plans and attaining the standard but EPA encourages tribes to work with EPA to take appropriate actions to reduce PM<sub>2.5</sub> emissions.

### ***What are the requirements for tribal stationary sources located in PM<sub>2.5</sub> nonattainment areas?***

New and modified major sources must utilize control technologies that achieve the lowest emissions possible and must offset their increased emissions with reductions from existing sources. Existing sources must employ reasonable controls. Stationary sources may be required to reduce emissions further in order to attain the PM<sub>2.5</sub> standard.

### ***Where can the public get more information about PM<sub>2.5</sub> designations?***

Visit the EPA website <http://cpa.gov/pmdesignations> or contact Krishna Viswanathan (206-553-2684) or Gina Bonifacino (206-553-2970) at the Regional Office.

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# Exhibit F

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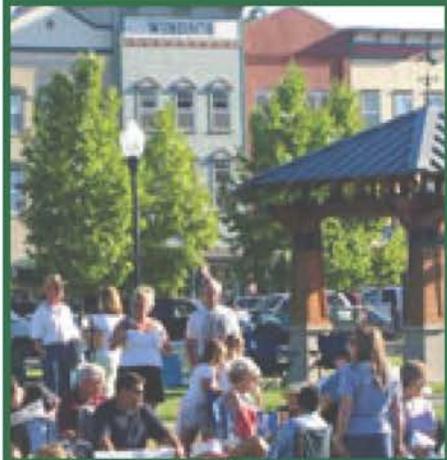
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## CEQA & Climate Change

*Evaluating and Addressing Greenhouse  
Gas Emissions from Projects Subject to  
the California Environmental Quality Act*

January 2008

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## Disclaimer

The California Air Pollution Control Officers Association (CAPCOA) has prepared this white paper consideration of evaluating and addressing greenhouse gas emissions under the California Environmental Quality Act (CEQA) to provide a common platform of information and tools to support local governments.

This paper is intended as a resource, not a guidance document. It is not intended, and should not be interpreted, to dictate the manner in which an air district or lead agency chooses to address greenhouse gas emissions in the context of its review of projects under CEQA.

This paper has been prepared at a time when California law has been recently amended by the Global Warming Solutions Act of 2006 (AB 32), and the full programmatic implications of this new law are not yet fully understood. There is also pending litigation in various state and federal courts pertaining to the issue of greenhouse gas emissions. Further, there is active federal legislation on the subject of climate change, and international agreements are being negotiated. Many legal and policy questions remain unsettled, including the requirements of CEQA in the context of greenhouse gas emissions. This paper is provided as a resource for local policy and decision makers to enable them to make the best decisions they can in the face of incomplete information during a period of change.

Finally, this white paper reviews requirements and discusses policy options, but it is not intended to provide legal advice and should not be construed as such. Questions of legal interpretation, particularly in the context of CEQA and other laws, or requests for advice should be directed to the agency's legal counsel.

# Acknowledgements

*This white paper benefited from the hard work and creative insights of many people. CAPCOA appreciates the efforts of all who contributed their time and energy to the project. In particular, the Association thanks the following individuals:*

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## ***Contract Support***

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EDAW, Inc., Sacramento, CA (*review of analytical methods and mitigation strategies*).

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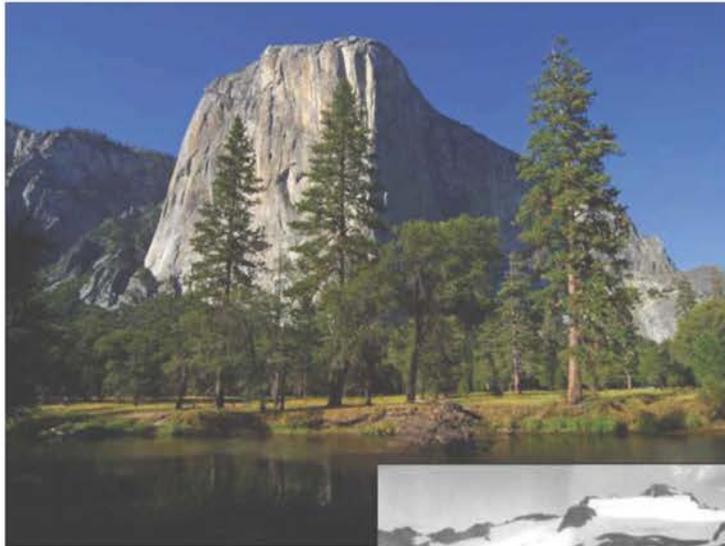
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**Introduction**

The California Environmental Quality Act (CEQA) requires that public agencies refrain from approving projects with significant adverse environmental impacts if there are feasible alternatives or mitigation measures that can substantially reduce or avoid those impacts. There is growing concern about greenhouse gas emissions<sup>1</sup> (GHG) and recognition of their significant adverse impacts on the world’s climate and on our environment. In its most recent reports, the International Panel on Climate Change (IPCC) has called the evidence for this “unequivocal.” In California, the passage of the Global Warming Solutions Act of 2006 (AB 32) recognizes the serious threat to the “economic well-being, public health, natural resources, and the environment of California” resulting from global warming. In light of our current understanding of these impacts, public agencies approving projects subject to the CEQA are facing increasing pressure to identify and address potential significant impacts due to GHG emissions. Entities acting as lead agencies in the CEQA process are looking for guidance on how to adequately address the potential climate change impacts in meeting their CEQA obligations.



Air districts have traditionally provided guidance to local lead agencies on evaluating and addressing air pollution impacts from projects subject to CEQA. Recognizing the need for a common platform of information and tools to support decision makers as they establish policies and programs for GHG and CEQA, the California Air Pollution Control Officers Association has prepared a white paper reviewing policy choices, analytical tools, and mitigation strategies.

This paper is intended to serve as a resource for public agencies as they establish agency procedures for reviewing GHG emissions from projects under CEQA. It considers the application of thresholds and offers three alternative programmatic approaches toward

<sup>1</sup> Throughout this paper GHG, CO<sub>2</sub>, CO<sub>2</sub>e, are used interchangeably and refer generally to greenhouse gases but do not necessarily include all greenhouse gases unless otherwise specified.

determining whether GHG emissions are significant. The paper also evaluates tools and methodologies for estimating impacts, and summarizes mitigation measures. It has been prepared with the understanding that the programs, regulations, policies, and procedures established by the California Air Resources Board (CARB) and other agencies to reduce GHG emissions may ultimately result in a different approach under CEQA than the strategies considered here. The paper is intended to provide a common platform for public agencies to ensure that GHG emissions are appropriately considered and addressed under CEQA while those programs are being developed.

### Examples of Other Approaches

Many states, counties, and cities have developed policies and regulations concerning greenhouse gas emissions that seek to require or promote reductions in GHG emissions through standards for vehicle emissions, fuels, electricity production/renewables, building efficiency, and other means. A few have developed guidance and are currently considering formally requiring or recommending the analysis of greenhouse gas emissions for development projects during their associated environmental processes. Key work in this area includes:

- Massachusetts Office of Energy and Environmental Affairs Greenhouse Gas Emissions Policy;
- King County, Washington, Executive Order on the Evaluation of Climate Change Impacts through the State Environmental Policy Act;
- Sacramento AQMD interim policy on addressing climate change in CEQA documents; and
- Mendocino AQMD updated guidelines for use during preparation of air quality impacts in Environmental Impact Reports (EIRs) or mitigated negative declarations.



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The following paper evaluates options for lead agencies to ensure that GHG emissions are appropriately addressed as part of analyses under CEQA. It considers the use of significance thresholds, tools and methodologies for analyzing GHG emissions, and measures and strategies to avoid, reduce, or mitigate impacts.

### Greenhouse Gas Significance Criteria

This white paper discusses three basic options air districts and lead agencies can pursue when contemplating the issues of CEQA thresholds for greenhouse gas emissions. This paper explores each path and discusses the benefits and disbenefits of each. The three basic paths are:

- No significance threshold for GHG emissions;

- GHG emissions threshold set at zero; or
- GHG threshold set at a non-zero level.

Each has inherent advantages and disadvantages. Air districts and lead agencies may believe the state or national government should take the lead in identifying significance thresholds to address this global impact. Alternatively, the agency may believe it is premature or speculative to determine a clear level at which a threshold should be set. On the other hand, air districts or lead agencies may believe that every GHG emission should be scrutinized and mitigated or offset due to the cumulative nature of this impact. Setting the threshold at zero will place all discretionary projects under the CEQA microscope. Finally, an air district or lead agency may believe that some projects will not benefit from a full environmental impact report (EIR), and may believe a threshold at some level above zero is needed.

This paper explores the basis and implications of setting no threshold, setting a threshold at zero and two primary approaches for those who may choose to consider a non-zero threshold. The first approach is grounded in statute (AB 32) and executive order (EO S-3-05) and explores four possible options under this scenario. The options under this approach are variations of ways to achieve the 2020 goals of AB 32 from new development, which is estimated to be about a 30 percent reduction from business as usual.

The second approach explores a tiered threshold option. Within this option, seven variations are discussed. The concepts explored here offer both quantitative and qualitative approaches to setting a threshold as well as different metrics by which tier cut-points can be set. Variations range from setting the first tier cut-point at zero to second-tier cut-points set at defined emission levels or based on the size of a project. It should be noted that some applications of the tiered threshold approach may require inclusion in a General Plan or adoption of enabling regulations or ordinances to render them fully effective and enforceable.

### **Greenhouse Gas Analytical Methodologies**

The white paper evaluates various analytical methods and modeling tools that can be applied to estimate the greenhouse gas emissions from different project types subject to CEQA. In addition, the suitability of the methods and tools to characterize accurately a project's emissions is discussed and the paper provides recommendations for the most appropriate methodologies and tools currently available.

The suggested methodologies are applied to residential, commercial, specific plan and general plan scenarios where GHG emissions are estimated for each example. This chapter also discusses estimating emissions from solid waste facilities, a wastewater treatment plant, construction, and air district rules and plans.

Another methodology, a service population metric, that would measure a project's overall GHG efficiency to determine if a project is more efficient than the existing statewide average for per capita GHG emissions is explored. This methodology may be more directly correlated to a project's ability to help achieve objectives outlined in AB 32, although it relies on establishment of an efficiency-based significance threshold. The subcommittee believes this methodology may eventually be appropriate to evaluate the long-term GHG emissions from a project in the context of meeting AB 32 goals. However, this methodology will need further work and is not considered viable for the interim guidance presented in this white paper.

### Greenhouse Gas Mitigation Measures

Common practice in environmental protection is first to avoid, then to minimize, and finally to compensate for impacts. When an impact cannot be mitigated on-site, off-site mitigation can be effectively implemented in several resource areas, either in the form of offsetting the same impact or preserving the resource elsewhere in the region.

This white paper describes and evaluates currently available mitigation measures based on their economic, technological and logistical feasibility, and emission reduction effectiveness. The potential for secondary impacts to air quality are also identified for each measure. A summary of current rules and regulations affecting greenhouse gas emissions and climate change is also provided.



Reductions from transportation related measures (e.g., bicycle, pedestrian, transit, and parking) are explored as a single comprehensive approach to land use. Design measures that focus on enhancing alternative transportation are discussed. Mitigation measures are identified for transportation, land use/building design, mixed-use development, energy efficiency, education/social awareness and construction.

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### Introduction

This chapter evaluates the availability of various analytical methods and modeling tools that can be applied to estimate the greenhouse gas emissions from different project types subject to CEQA. This chapter will also provide comments on the suitability of the methods and tools to accurately characterize a project's emissions and offer recommendations for the most favorable methodologies and tools available. Some sample projects will be run through the methodologies and modeling tools to demonstrate what a typical GHG analysis might look like for a lead agency to meet its CEQA obligations. The air districts retained the services of EDAW environmental consultants to assist with this effort.

### Methodologies/Modeling Tools

There are wide varieties of discretionary projects that fall under the purview of CEQA. Projects can range from simple residential developments to complex expansions of petroleum refineries to land use or transportation planning documents. It is more probably than not, that a number of different methodologies would be required by any one project to estimate its direct and indirect GHG emissions. Table 10 contains a summary of numerous modeling tools that can be used to estimate GHG emissions associated with various emission sources for numerous types of project's subject to CEQA. The table also contains information about the models availability for public use, applicability, scope, data requirements and its advantages and disadvantages for estimating GHG emissions.

In general, there is currently not one model that is capable of estimating all of a project's direct and indirect GHG emissions. However, one of the models identified in Table 9 would probably be the most consistently used model to estimate a project's direct GHG emissions based on the majority of projects reviewed in the CEQA process. The Urban Emissions Model (URBEMIS) is designed to model emissions associated with development of urban land uses. URBEMIS attempts to summarize criteria air pollutants and CO<sub>2</sub> emissions that would occur during construction and operation of new development. URBEMIS is publicly available and already widely used by CEQA practitioners and air districts to evaluate criteria air pollutants emissions against air district-adopted significance thresholds. URBEMIS is developed and approved for statewide use by CARB. The administrative reasons for using URBEMIS are less important than the fact that this model would ensure consistency statewide in how CO<sub>2</sub> emissions are modeled and reported from various project types.

One of the shortfalls of URBEMIS is that the model does not contain emission factors for GHGs other than CO<sub>2</sub>, except for methane (CH<sub>4</sub>) from mobile-sources, which is converted to CO<sub>2</sub>e. This may not be a major problem since CO<sub>2</sub> is the most important GHG from land development projects. Although the other GHGs have a higher global warming potential, a metric used to normalize other GHGs to CO<sub>2</sub>e, they are emitted in far fewer quantities. URBEMIS does not calculate other GHG emissions associated with

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off-site waste disposal, wastewater treatment, emissions associated with goods and services consumed by the residents and workers supported by a project. Nor does URBEMIS calculate GHGs associated with consumption of energy produced off-site. (For that matter, URBEMIS does not report criteria air pollutant emissions from these sources either).

Importantly, URBEMIS does not fully account for interaction between land uses in its estimation of mobile source operational emissions. Vehicle trip rates are defaults derived from the Institute of Transportation Engineers trip generation manuals. The trip rates are widely used and are generally considered worst-case or conservative. URBEMIS does not reflect “internalization” of trips between land uses, or in other words, the concept that a residential trip and a commercial trip are quite possibly the same trip, and, thus, URBEMIS counts the trips separately. There are some internal correction settings that the modeler can select in URBEMIS to correct for “double counting”; however, a project-specific “double-counting correction” is often not available. URBEMIS does allow the user to overwrite the default trip rates and characteristics with more project-specific data from a traffic study prepared for a project.

### **Residential, Commercial, Mixed-Use Type Projects/ Specific Plans**

#### Direct Emissions

URBEMIS can be used to conduct a project-specific model run and obtain CO<sub>2</sub>e emissions for area and mobile sources from the project, and convert to metric tons CO<sub>2</sub>e. When a project-specific traffic study is not available, the user should consult with their local air district for guidance. Many air district staff are experienced practitioners of URBEMIS and can advise the lead agency or the modeler on how to best tailor URBEMIS default input parameters to conduct a project-specific model run. When a traffic study has been prepared for the project, the user must overwrite default trip length and trip rates in URBEMIS to match the total number of trips and vehicle miles traveled (VMT) contained in the traffic study to successfully conduct a project-specific model run. URBEMIS is recommended as a calculation tool to combine the transportation study (if available) and EMFAC emission factors for mobile-sources. Use of a project-specific traffic study gets around the main shortfall of URBEMIS: the lack of trip internalization. URBEMIS also provides the added feature of quantifying direct area-source GHG emissions.

#### Important steps for running URBEMIS

1. Without a traffic study prepared for the project, the user should consult with the local air district for direction on which default options should be used in the modeling exercise. Some air districts have recommendations in the CEQA guidelines.
2. If a traffic study was prepared specifically for the project, the following information must be provided:

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- a. Total number of average daily vehicle trips *or* trip-generation rates by land use type per number of units; and,
  - b. Average VMT per residential *and* nonresidential trip.
  - c. The user overwrites the “Trip Rate (per day)” fields for each land use in URBEMIS such that the resultant “Total Trips” and the “Total VMT” match the number of total trips and total VMT contained in the traffic study.
  - d. Overwrite “Trip Length” fields for residential and nonresidential trips in URBEMIS with the project-specific lengths obtained from the traffic study.
3. Calculate results and obtain the CO<sub>2</sub> emissions from the URBEMIS output file (units of tons per year [TPY]).

Indirect Emissions

URBEMIS does estimate indirect emissions from landscape maintenance equipment, hot water heaters, etc. URBEMIS does not however, provide modeled emissions from indirect sources of emissions, such as those emissions that would occur off-site at utility providers associated with the project’s energy demands. The California Climate Action Registry (CCAR) Protocol v.2.2 includes methodology, which could be used to quantify and disclose a project’s increase in indirect GHG emissions from energy use. Some assumptions must be made for electrical demand per household or per square foot of commercial space, and would vary based on size, orientation, and various attributes of a given structure. An average rate of electrical consumption for residential uses is 7,000 kilowatt hours per year per household and 16,750 kilowatt hours per thousand square feet of commercial floor space. Commercial floor space includes offices, retail uses, warehouses, and schools. These values have been increasing steadily over the last 20 years. Energy consumption from residential uses has increased due to factors such as construction and occupation of larger homes, prices of electricity and natural gas, and increased personal income allowing residents to purchase more electronic appliances. Commercial energy consumption is linked to factors such as vacancy rates, population, and sales.

The modeler will look up the estimated energy consumption for the project’s proposed land uses under year of project buildout, or use the values given in the previous paragraph for a general estimate. The CCAR Protocol contains emission factors for CO<sub>2</sub>, CH<sub>4</sub>, and nitrous oxide. The “CALI” region grid serves most of the State of California. If a user has information about a specific utility provider’s contribution from renewable sources, the protocol contains methodology to reflect that, rather than relying on the statewide average grid. The incremental increase in energy production associated with project operation should be accounted for in the project’s total GHG emissions for inclusion in the environmental document.

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The incremental increase in energy production associated with project operation should be accounted for in the project's total GHG emissions, but it should be noted that these emissions would be closely controlled by stationary-source control-based regulations and additional regulations are expected under AB 32. However, in the interest of disclosing project-generated GHG emissions and mitigating to the extent feasible, the indirect emissions from off-site electricity generation can be easily calculated for inclusion in the environmental document.

### Example Project Estimates for GHG Emissions

#### Residential Project

Project Attributes:

- 68 detached dwelling units
- 15.9 acres
- 179 residents
- 0 jobs
- Located in unincorporated Placer County (PCAPCD jurisdiction)
- Analysis year 2009

As shown in Table 6, the project's direct GHG emissions per service population (SP) would be approximately 8 metric tons CO<sub>2</sub>e/SP/year.

**Table 6: Residential Project Example GHG Emissions Estimates**

URBEMIS Output (Project Specific)	Metric Tons/Year CO <sub>2</sub> e	Demographic Data	
Area-source emissions	251	Residents	179
Mobile-source emissions	1,044	Jobs	0
Indirect emissions (from CCAR Protocol)	174		
Total operational emissions	<b>1,469</b>	Service population	179
Operational emissions/SP	<b>8.2</b>		
Notes: CO <sub>2</sub> e = carbon dioxide equivalent; CCAR = California Climate Action Registry; SP = service population(see definition of service population below in discussion of Normalization/Service Population Metric).			
Sources: EDAW 2007, ARB 2007b, CCAR 2007, CEC 2000			

#### Commercial Project

Project Attributes:

- Free Standing Discount Superstore: 241 thousand square feet (ksf)
- 0 residents

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