Shaping our community together

CITY OF LACEY

WORKSESSION
LACEY CITY COUNCIL
THURSDAY, JANUARY 15, 2015
7:00 – 9:15 P.M.
LACEY CITY HALL, 420 COLLEGE STREET SE

AGENDA

7:00 **ASTOUND BROADBAND TELECOMMUNICATIONS FRANCHISE REQUEST**
LIZ GOTELLI, PUBLIC AFFAIRS – HUMAN RESOURCES DIRECTOR
STEVE KIRKMAN, SENIOR MANAGEMENT ANALYST - PA
(ATTACHMENT)

7:30 **AMENDED MOA WITH SOUTH SOUND MILITARY COMMUNITY PARTNERSHIP**
SCOTT SPENCE, CITY MANAGER
(ATTACHMENT)

7:45 **PLANNING COMMISSION RECOMMENDATION ON STREET TREE ORDINANCE**
RICK WALK, COMMUNITY DEVELOPMENT DIRECTOR
RYAN ANDREWS, PLANNING MANAGER - CD
(ATTACHMENT)

8:30 **PLANNING COMMISSION RECOMMENDATION ON SIGN ORDINANCE**
RICK WALK, COMMUNITY DEVELOPMENT DIRECTOR
RYAN ANDREWS, PLANNING MANAGER - CD
(ATTACHMENT)

9:15 **ADJOURN**

LACEY CITY COUNCIL WORKSESSION
January 15, 2015

SUBJECT: **Astound Broadband Telecommunications Franchise Application**

RECOMMENDATION: Discussion of the telecommunications franchise application prior to consideration for approval during the January 22, 2015, meeting of the City Council.

STAFF CONTACT: Scott Spence, City Manager SS
Liz Gotelli, Public Affairs and Human Resources Director
Steve Kirkman, Public Affairs Manager SHK

ORIGINATED BY: Public Affairs Department

ATTACHMENTS:
1. Astound Broadband Telecommunications Franchise
2. Exhibit A: Map of Planned Telecommunications Route

FISCAL NOTE: No fiscal impact is anticipated.

PRIOR REVIEW: This is the first review of Astound Broadband's telecommunications franchise application.

BACKGROUND:

Astound Broadband LLC is a wholly-owned subsidiary of WaveDivision Holdings, headquartered in Kirkland, Washington. Through its operating subsidiaries, WaveDesign provides cable television, high-speed data and VoIP telephone services to over 415,500 customers in Oregon, Washington and California.

Astound desires install facilities to provide telecommunications, internet access, and private line services to potential customers, including mobile backhaul services to existing cell phone towers along a route from the city's western city limits at 14th Avenue SE to the eastern city limits at Pacific Avenue SE (see Exhibit A: Map of Planned Telecommunications Route). The proposal involves a combination of overhead installation on existing poles and undergrounding in conduits. In total, the planned project will span approximately 11,000 linear feet. A new franchise would be required for any additional routes within the city, or if the currently proposed route is altered in a significant way.

Astound's proposal to occupy public rights-of-way is regulated by Lacey Municipal Code Chapter 5.60: Telecommunications. Passed in 1999, the purpose of LMC Chapter 5.60 is to permit reasonable and fair access to the public rights-of-way within the corporate boundaries of the City for telecommunications purposes (i.e., voice, data, video, etc.). The City, at the time, also recognized that it was necessary to manage and conserve the limited physical capacity of the public rights-of-way and put into place reasonable regulations for the protection of the community's rights-of-way.

Additionally, Council recognized there is a cost to manage and maintain the City rights-of-way, and entities requesting access must compensate the public for its use.

The proposed Astound Broadband Telecommunications Franchise requires that Astound comply with all conditions and regulations established by LMC Chapter 5.60. For example, Astound shall carry a minimum of $2 million in liability insurance during the term of the franchise, overhead facilities shall be underground if required by a public improvement project, and the restoration and maintenance of the public rights-of-way must meet Lacey Development Guidelines if disturbed by the franchise holder.

In addition, Astound must acquire a performance bond, which shall remain in place until the Director of Public Works has approved the work. The bond shall then be maintained for 1 year after the approval of work.

In addition to the $3,000 franchise application fee, Astound will be required to acquire a right-of-way access permit, and pay all fees generally applicable to persons doing business within the City.

Astound shall also be required to pay public utility business taxes levied by Chapter 3.01 of the Lacey Municipal Code.

The term of the Franchise Agreement is for five years from the date of execution.

ADVANTAGES:

The Astound Broadband franchise provides for the orderly management and regulation of the City's rights-of-way, and establishes compensation to the City for the granting of the franchise.

DISADVANTAGES:

No disadvantages are foreseen.

ASTOUND BROADBAND LLC
TELECOMMUNICATIONS FRANCHISE AGREEMENT

THIS AGREEMENT is made and entered into this _____ day of _____, 2015, by and between the City of Lacey, a municipal corporation of the State of Washington, hereinafter called "City" and Astound Broadband LLC, a Washington limited liability company, hereinafter called "Astound."

WHEREAS, Astound has requested the City to grant a franchise to install facilities to provide telecommunications, internet access, and private line services to potential customers, including mobile backhaul services to existing cell phone towers, along that certain route identified on Exhibit A, attached hereto, and

WHEREAS, the City has enacted Chapter 5.60 of the Lacey Municipal Code which provides for the requirements, conditions and procedures for installation of such facilities in the City right-of-way and the granting of a franchise for the same, and

WHEREAS, Astound has paid to the City a franchise application fee the sum of Three Thousand Dollars ($3,000.00).

NOW, THEREFORE, IT IS HEREBY AGREED BETWEEN THE PARTIES AS FOLLOWS:

1. The City hereby grants a franchise to Astound to install facilities to provide telecommunications, internet access, and private line services to potential customers, including mobile backhaul services to existing cell phone towers, along that specific route shown on Exhibit A, attached hereto subject to the following conditions:

A. This grant and the requirements and procedures to be followed shall specifically be subject to all provisions of Chapter 5.60 of the Lacey Municipal Code and the Development Guidelines and Public Works Standards of the City.

B. The performance bond required by the terms of Lacey Municipal Code Section 5.60.140B shall be acquired and shall remain in place until the Director of Public Works has approved the work. The bond shall then be maintained for 1 year after the approval of the work.

C. Astound shall, in addition to the franchise application fee provided to the City above, pay to the City all right-of-way permits or other fees generally applicable to all other persons doing business in the City. In addition, Astound shall pay to the City that certain public utility business tax levied by Chapter 3.01 of the Lacey Municipal Code as the same now exists or may hereafter be amended.

D. Before commencing any work pursuant to this agreement, Astound shall first file with the City an application for a permit to do such work, accompanied by drawings showing the position and location of all conduit, wire, fiber or any other equipment sought to

be constructed, laid, installed or erected the depth below the surface of the ground and the relative position to existing streets, other utilities and other public places or ways.

E. Astound shall, at all times, keep a complete set of plans, specifications and records showing the exact location and depth of all such facilities. These records shall be subject to inspection by the City at any reasonable time. In addition, Astound shall provide to the City this information in the electronic format specified by the City.

F. Astound shall place any new facilities underground in areas where existing telecommunications and cable facilities are installed underground. In areas where existing facilities are installed above ground, Astound may install facilities above ground, and at such time as the City requires other utilities to install facilities in the area underground, Astound will move its facilities underground.

G. Any new facilities to be located above-ground shall be placed on existing utility poles. No new utility poles shall be installed in connection with placement of new above-ground facilities.

2. The term of this agreement shall be five (5) years from the date of execution. Such term may be extended under conditions approved by both the City and Astound, its successors and assigns.

In witness whereof, the parties have hereunto set their hands this day and date first above written.

CITY OF LACEY	ASTOUND
By_____	By: _____
Scott H. Spence, City Manager	Its: _____

ATTEST:

_____
Carol Litten, City Clerk

APPROVED AS TO FORM:

_____
David Schneider, City Attorney

Astound Broadband, LLC

Fiber Optic Routing

In

Lacey, WA

LACEY CITY COUNCIL MEETING
January 15, 2015

SUBJECT: **Amended Memorandum of Agreement related to the ongoing support of the South Sound Military and Communities Partnership.**

RECOMMENDATION: **Approve amended Memorandum of Agreement related to the ongoing support of the South Sound Military and Communities Partnership, and authorize the City Manager to sign agreement. And, consider a request to increase Lacey's financial contribution comparable to the City of Lakewood and Pierce County.**

STAFF CONTACT: Scott Spence, City Manager

ORIGINATED BY: City Manager's Office

ATTACHMENTS:

1. South Sound Military and Communities Partnership Memorandum of Agreement – approved by City Council on December 5, 2013.
2. Amended South Sound Military and Communities Partnership Memorandum of Agreement (Legislative Format).
3. Amended South Sound Military and Communities Partnership Memorandum of Agreement (Final)
4. Letter from Lakewood City Manager and Chair of Executive Leadership Team – dated November 21, 2014.

FISCAL NOTE: City of Lacey's current annual contribution to SSMCP is $20,000 per year. There is a request for an increased contribution from Lacey, comparable to the amount paid by the City of Lakewood and Pierce County ($50,000). This request, by the Chair of the Executive Leadership Team, recommends a phased approach over the next two years. If approved a budget amendment would be required for 2015.

PRIOR REVIEW: The activities of the South Sound Military and Communities Partnership have been presented to Council several times in the past. This specific amended Memorandum of Agreement, however, is new.

BACKGROUND:

The Lacey City Council approved a new South Sound Military and Communities Partnership Memorandum of Agreement on December 5, 2013. This new Memorandum of Agreement (MOA) revised the structure of the South Sound Military and Communities Partnership (SSMCP) to better

respond to emerging issues related to Joint Base Lewis-McChord)JBLM. It also extended opportunities for greater participation to groups, organizations, and local governments in both Pierce County and Thurston County interested in impacts and activities associated with JBLM.

SSMCP receives policy direction from an Elected Officials Council (EOC). The EOC is comprised of elected officials representing local governments adjacent to JBLM; the Lacey Mayor currently serves on the EOC. Additionally, oversight and strategic direction is provided to SSMCP by a Steering Committee. The chief appointed official from each local government, and other charter organizations, serve on this committee and meets monthly; Lacey's City Manager attends the monthly Steering Committee meetings. In addition, the new MOA instituted an Executive Leadership Team (ELT) to oversee the day-to-day operations of the SSMCP and respond to emerging issues. Lacey is one of three members serving on the ELT. The other two members are the City of Lakewood and Pierce County.

Currently, the SSMCP budget totals approximately $250,000. This pays for two fulltime staff, coordination events, special projects, travel and other related expenses. Significant activities the SSMCP is currently engaged in include the Joint Land Use Study for jurisdictions adjacent to JBLM and the Army 2020 Force Structure Realignment process.

PROPOSAL:

The SSMCP is recommending amended language to the existing MOA (see attached documents) to better clarify its function and focus of support. The amended MOA also adds new members to the partnership such as City of University Place and Tacoma Pierce County Department of Health. Minor amendments to the timing of invoicing are also part of this revision.

Concurrent with the routing of an amended MOA for SSMCP, the Chair of the Executive Leadership Team (ELT) sent a letter to the City asking consideration for increased financial commitment to SSMCP. At present, the City of Lacey pays $20,000 per year, which includes participation on the ELT as well as the Steering Committee. This particular request asks the City of Lacey to increase its financial commitment up to a level comparable to the City of Lakewood and Pierce County (i.e., $50,000). The request, however, offers that this increased financial commitment can be phased in over time—two years.

The new MOA is being routed to current and new members of SMMCP with the goal of approving the amended agreement by the end of the month.

ADVANTAGES:

1. Affirms the City of Lacey's commitment to the military community and helps plan for the future as it relates to activities and changes in troop levels at JBLM.

2. The partnership provides an effective regional voice representing the combined interests of Thurston and Pierce counties centered on JBLM.

3. Establishes an effective communication channel and collaborative opportunities among participants of the SSMCP and military representatives from JBLM.

DISADVANTAGES:

1. A request for an increased financial commitment from the City of Lacey to sustain activities undertaken by the SSMCP. However, the level of commitment is consistent with other members participating at the Executive Leadership Team level.

SOUTH SOUND MILITARY & COMMUNITIES PARTNERSHIP

MEMORANDUM OF AGREEMENT

This agreement is made between the undersigned parties and hereto it is agreed as follows:

I. Establishment:
This Memorandum of Agreement (MOA) establishes the structure, roles and responsibilities of the South Sound Military & Communities Partnership (SSMCP, or the Partnership). This MOA is built upon a previous MOA dated May 1, 2011 and supersedes that document.

II. Purpose:
The Partnership provides a framework for collaboration in the south Puget Sound region between local governments, military installations, State agencies, and Federal agencies to better coordinate efforts in areas such as: military relations; transportation and land use planning; environmental protection; emergency preparedness; data coordination; funding requests (e.g., grant applications); health care coordination; population forecasting; workforce development; education; housing; community development; economic development; and other issues that may arise. The Partnership provides actionable recommendations to regional leaders on initiatives, programs, and topics that strengthen the role that Joint Base Lewis-McChord (JBLM), the National Guard, and Reserves play in America's defense strategy and the economic health and vitality of the region and the State of Washington. The Partnership:

a. Focuses on the intersection of issues between local governments and the military community, engaging the support of the business, healthcare, education, workforce development, and social services communities;
b. Assists in the coordination of governmental efforts so that all citizens of the community can receive the full benefits of the economic, civil, commercial, cultural, and educational opportunities presented to them, and so that the impact of the military community will be fairly shared;
c. Promotes the general welfare of the region;
d. Acts on behalf of the members as the regional organization recognized by the Federal government for applying for community assistance and grants related to mission changes and/or growth at JBLM and Camp Murray; and
e. Acts as the regional representative of the member governments to coordinate with JBLM and Camp Murray regarding the ability of each installation to accomplish its current and future projected mission.

III. Objectives:

1. Work collaboratively to create, expand, and improve opportunities to collect and disseminate information and best practices that address the challenges of the local communities, residents, businesses, and military installations in our region to succeed in meeting their own needs without preventing the others from meeting their needs, both now and in the future. Specifically:

a. Coordinate and provide recommendations to the region's leaders to remedy and protect JBLM from encroachment or other initiatives that could result in degradation of or restriction to military operations on or based out of JBLM.
b. Notify the local military installations of development proposals or other projects in the surrounding communities that may impact military operations.

2. Coordinate with commanders, communities, and State and Federal agencies on affairs that affect the installation and may require State coordination and assistance.
3. Serve as a "single point of contact" to ensure that communities, the military, Washington State's congressional delegation, and other Federal agencies, as appropriate, are fully aware of activities likely to result in impacts or benefits to the region.
4. Support efforts by agencies and service providers in the region to implement the recommendations and strategies of the 2010 JBLM Growth Coordination Plan (GCP), which include:
   a. A sound infrastructure system, adequate housing and education, and transition support into Pierce and Thurston county workforces for military members and their families, military retirees, and veterans;
   b. Support for economic development organizations and initiatives that focus on leveraging the military and related business opportunities to help create jobs and expand defense and homeland security related economic development activity in the South Sound.
5. Adopt processes, similar to those already in place for artillery firing notices, to ensure that the military installations provide timely advance notification of operations which are likely to impact other partner members, and that other partner members provide the same courtesy to the military installations.
6. Discuss and potentially act upon other issues or matters that the SSMCP deems essential to fulfilling its purpose.

IV. Responsibilities:

1. Maintain a vision, organizational structure, brand, and a Work Plan for the Partnership consistent with the recommendations and strategies identified in the GCP and subsequent documents.
2. Form Working Groups (WG) that support the Partnership and the implementation of the recommendations in the GCP. Consider stakeholders involved in the ten Expert Panels of the GCP effort for these working groups, but also be open to new stakeholders.
3. Develop and commit to a schedule of regular meetings for the Partnership and the WGs.
4. Hold an annual forum open to all members that includes speakers from JBLM and regional stakeholders to share news; report on major changes at JBLM and in local jurisdictions; discuss progress on GCP strategies and other plans; network; recognize outstanding service; and celebrate new partnerships and programs.
5. Formalize a method for data sharing between JBLM and the surrounding communities which would include the most recent military related population changes, including incoming personnel, deployments, Department of Defense (DoD) civilian operations, and construction projects.
6. Develop periodic memoranda, schedules or press releases to share with members regarding expansion/contraction of JBLM personnel, mobilization, and deployment.
7. Support information-sharing with state and federal legislative bodies.
8. Accept an active role to ensure that GCP-related recommendations are funded and sustained through the foreseeable future.

V. Membership:

To ensure efforts of the Partnership are planned, coordinated, and implemented with a focus on outcomes, the structure of the SSMCP is as follows:

1. **General Membership.**

   Role: The primary role of the general membership is to provide expertise, perspective and guidance to the Steering Committee on specific topics that promote the objectives of the SSMCP. Members will gather at least annually (more often, if necessary) to share best practices and receive information on changes at JBLM and Camp Murray, and in adjacent communities. They will also be encouraged to share their insights on existing conditions and growth trends; assist in the development of the GCP implementation; and to review any studies, products, and other information developed by staff. Working Groups (WG) will be established based on the strategies outlined in the GCP and on other topics of interest within the SSMCP membership. Each WG will select a spokesperson/chair that will serve on the Steering Committee to represent their strategy area/topic of interest. WG chairs will be expected to report on GCP strategy progress, and may also take new initiatives to the Steering Committee for consideration as part of the Partnership's annual work plan. The WGs already established include Transportation & Infrastructure (TI), Business & Development (BD), Social Services (SS), and Healthcare (HC).

   Participants: The Partnership is open to any person, association, group, or organization having an interest in the purpose and objectives of the SSMCP and will be considered a member upon payment of the annual dues established by the Steering Committee. The Partnership is intended to be as inclusive as necessary to address the numerous topical areas covered in the GCP.

2. **Executive Leadership Team.**

   Role: The Executive Leadership Team (ELT) is operational in nature, overseeing the day-to-day work of Partnership staff, activities and budget and serving as a sounding board for staff on emerging issues, problems, and initiatives that may occur during the interval between meetings of the full Steering Committee. The ELT is structured to promote timely and manageable communication and coordination between leadership and staff.

3. **Steering Committee.**

   Role: The Steering Committee (SC) is the foundation of the Partnership and the members are committed to remaining actively involved in the Partnership moving forward. The SC provides broad oversight to the implementation of the recommendations, strategies and action items outlined in the GCP and subsequent documents. The Committee coordinates the work of assigned staff with members of the Partnership, helps develop an annual work plan to implement GCP strategies, approves the annual work plan, authorizes the annual budget, and is committed to ensuring that the SSMCP remains sustainable and has high value for the region. Finally, the SC is responsible for authorizing the creation of WGs that reflect the needs, opportunities and intersection of military and community issues. Regular members will typically represent the local military installations, local and state governments, and affected service districts in the region. The SC shall meet as necessary, but not less than quarterly, in order to coordinate the activities of assigned staff and clarify issues, formulate strategies, and propose action plans.

4. **Elected Officials Council.**

   Role: The current Elected Officials Council (EOC) role and structure will be maintained to continue advocating for military issues of mutual concern in the south Puget Sound region.

   Participants: All elected leaders within Pierce and Thurston Counties, the surrounding cities and legislative districts are invited to attend EOC meetings, but a single representative from each governmental body is requested to represent their interests on the EOC. The EOC would continue

to be convened by the Mayor of Lakewood, the Pierce County Executive, and the Chair of the Thurston County Commissioners 2-3 times annually to receive updates on military and community issues, review the annual work plan, coordinate legislative strategies, and suggest outreach efforts to maintain a high level of visibility for these priorities. EOC meetings will conform to the Open Public Meetings Act of the State of Washington, 42.30 RCW.

VI. Funding:

There is a financial commitment required to participate in the Partnership. To ensure smooth and continuous operations through over time, it is desirable to structure for maximum financial stability. To that end, the dues for ELT and SC members are set based on the funds needed for pay, benefits, and program overhead for two full-time SSMCP staff members to focus on the work plan priorities established by the SC. Costs are also expected to include operations and administration, consultant efforts, and the commissioning of special studies as well as other activities as approved by the Steering Committee. Each year, in conjunction with preparation of the Annual Work Plan and Budget, dues will be calculated based on a methodology agreed to by a majority of the combined ELT and SC members. This commitment is outlined in Appendix A of this Agreement.

VII. Formation of Subcommittees:

The Partnership may be supported by technical experts, advisors, and community staff and leadership in various agency, jurisdictional, non-profit, and institutional capacities. Subcommittees will be formed by action of the SC as necessary to carry out the specific recommendations and strategies of the GCP.

VIII. Review/Changes:

The signatories (or their successors) will review this MOA periodically, but no less than annually. Proposed changes to this MOA will be in writing and shall be subject to approval in any event by the signatories or their successors.

IX. Effective Date and Termination:

This Agreement is effective when signed and shall remain in effect until terminated by a majority of the Steering Committee members in good standing. Any member partner may terminate its membership in the Partnership by providing no less than 30 days written notice to the Partnership of the desired termination date.

X. Indemnification:

Each Party shall defend, indemnify and hold each other harmless from any and all claims, demands, suits, actions, judgments, recoveries, liabilities, penalties, costs and expenses, including, but not limited to reasonable attorneys' fees, resulting from damage or bodily injury, including death, to the extent caused by a Party's breach of this Agreement or the negligent actions or omissions of that Party, or its employees, agents, or officers, elected or appointed. The foregoing indemnity specially covers actions brought by the Party's own employees, and each Party agrees that the foregoing indemnity is specifically and expressly intended to constitute a waiver of immunity under Washington's Industrial Insurance Act, RCW Title 51, but only as to the Party entitled to indemnity and only to the extent necessary to provide a full and complete indemnity as required under this Section. The indemnification obligation provided in this section shall survive the expiration or earlier termination of this Agreement for the duration of any applicable statute of limitations.

XI. Effect of Agreement:

This MOA is an internal agreement and does not confer any rights upon any individual or other entity. This MOA sets forth mutual goals and approaches. This MOA is not intended to create any rights, benefits, or other responsibilities, either substantive or procedural, nor is it enforceable as law or equity by a party against the U.S., its agencies, its officers, or any other person.

Nothing in this MOA shall obligate members to expend other monies or enter into any contract or other obligation. Nothing in the MOA shall be interpreted as limiting, superseding, or otherwise affecting the Parties' normal operations or decisions in carrying out their statutory or regulatory duties. This MOA does not limit or restrict members from participating in similar activities or arrangements with other agencies.

Signed, dated and acknowledged:

Pierce County

City of Lacey

City of Lakewood

Joint Base Headquarters, Joint Base Lewis-McChord

City of DuPont

Thurston County

City of Tacoma

Town of Steilacoom

City of Yelm

Thurston Regional Planning Council

Nisqually Indian Tribe

Washington Military Department, Camp Murray

Tacoma - Pierce County Chamber of Commerce

Washington State Department of Transportation

United Way of Pierce County

EXHIBIT A

Membership and Annual Financial Commitment

The Executive Leadership Team (ELT) will be comprised of the following members:

1. City of Lacey
2. City of Lakewood
3. Pierce County
4. Joint Base Lewis-McChord Headquarters (advisory only)

The chief appointed official from each of the local governments will represent their jurisdiction on the ELT. JBLM will be represented by the Joint Base Commander (JBC) and/or his Chief of Staff. ELT members will also be members of the Steering Committee, and on an annual rotating basis (or other arrangement) each member of the ELT will serve as chair of the Steering Committee at the regular monthly meeting.

The Steering Committee (SC) will be comprised of regular members and Working Group (WG) Chairs. Regular members will consist of government representatives from the following:

1. City of DuPont
2. City of Tacoma
3. City of Yelm
4. Nisqually Tribe
5. Joint Base Lewis-McChord Headquarters
6. Thurston County
7. Thurston Regional Planning Council
8. Town of Steilacoom
9. Washington Military Department (Camp Murray)

The chief appointed official from each of the local governments will represent their jurisdiction on the SC.

The SC will also include a representative from each of the Working Groups (WG) that comprises the numerous public and private sector interests in our region. The WG chairs will be the chief appointed officials or their designees from the following:

1. Tacoma-Pierce County Chamber (as Chair of the Business and Development WG)
2. United Way of Pierce County (as Chair of the Health and Social Services WG)
3. Washington State Department of Transportation (as Chair of the Transportation WG).
4. If needed, other WG will be formed at the request of the SC, and Chairs will be appointed accordingly.

Financial Commitments

Financial commitments are tiered based on level of involvement, as follows:

1. Executive Leadership Team (ELT): City of Lacey $20,000, City of Lakewood $50,000, Pierce County $50,000.
2. Steering Committee: $6,500 annually unless this amount is prohibited by law, regulation, or local policy.
3. Working Group (WG) Chairs may be from nongovernmental entities. Their contribution will each be $2,500 annually for as long as they actively chair a WG.
4. General Members: General member dues are $500 annually.

Membership costs may be reduced through in-kind donations with advance approval of the majority of SC members in good standing. An example of an acceptable in-kind donation is staff time dedicated to SC Work Plan priorities that is significantly above and beyond that expected of all SC members in their role on the SC.

The City of Lakewood will act as the fiduciary agent for the SSMCP and will be responsible for invoicing the members pursuant to this agreement.

Invoicing

After signature, members will be invoiced for 2014 membership fees. Membership fee payment that is not received by February 1, 2014 will be considered late and will suspend the member's meeting attendance and voting privileges. A member's good standing will be reinstated upon receipt of the full membership fee.

SOUTH SOUND MILITARY & COMMUNITIES PARTNERSHIP

MEMORANDUM OF AGREEMENT

This agreement is made between the undersigned parties and hereto it is agreed as follows:

I. Establishment:
This Memorandum of Agreement (MOA) establishes the structure, roles and responsibilities of the South Sound Military & Communities Partnership (SSMCP, or the Partnership). This MOA ~~is built upon a previous MOA dated May 1, 2011 and~~ supersedes ~~-~~previous SSMCP MOAs~~that document~~.

II. Purpose:
The Partnership provides a framework for collaboration in the south Puget Sound region between local governments, military installations, State agencies, and Federal agencies to better coordinate efforts in areas such as: military relations; transportation and land use planning; environmental protection; emergency preparedness; data coordination; funding requests (e.g., grant applications); health care coordination; population forecasting; workforce development; education; housing; community development; economic development; and other issues that may arise. The Partnership provides actionable recommendations to regional leaders on initiatives, programs, and topics that strengthen the role that Joint Base Lewis-McChord (JBLM), the National Guard, and Reserves play in America's defense strategy and the economic health and vitality of the region and the State of Washington. The Partnership:

a. Focuses on the intersection of issues between local governments and the military community, engaging the support of the business, healthcare, education, workforce development, and social services communities;
b. Assists in the coordination of governmental efforts so that all citizens of the community can receive the full benefits of the economic, civil, commercial, cultural, and educational opportunities presented to them, and so that the impact of the military community will be fairly shared;
c. Promotes the general welfare of the region;
d. Acts on behalf of the members as the regional organization recognized by the Federal government for applying for community assistance and grants related to mission changes and/or growth at JBLM and Camp Murray; ~~and~~
e. Coordinates state and federal legislative educational and advocacy efforts by members and SSMCP staff related to the promotion of common interests as approved by the Steering Committee; and
~~e.~~f. Acts as the regional representative of the member governments to coordinate with JBLM and Camp Murray regarding the ability of each installation to accomplish its current and future projected mission.

DRAFT

III. Objectives:

1. Work collaboratively to create, expand, and improve opportunities to collect and disseminate information and best practices that address the challenges of the local communities, residents, businesses, and military installations in our region to succeed in meeting their own needs without preventing the others from meeting their needs, both now and in the future. Specifically:
   a. Coordinate and provide recommendations to the region's leaders to remedy and protect JBLM and Camp Murray from encroachment or other initiatives that could result in degradation of or restriction to military operations on or based out of JBLM and Camp Murray.
   b. Notify the local military installations of development proposals or other projects in the surrounding communities that may impact military operations.
2. Coordinate with commanders, communities, and State and Federal agencies on affairs that affect the installation and may require State coordination and assistance.
3. Serve as a "single point of contact" to ensure that communities, the military, Washington State's congressional delegation, and other Federal agencies, as appropriate, are fully aware of activities likely to result in impacts or benefits to the region.
4. Support efforts by agencies and service providers in the region to implement the recommendations and strategies of the 2010 JBLM Growth Coordination Plan (GCP) and more recenetly idenitified SSMCP priorities, which include:
   a. A sound infrastructure system, adequate housing and education, and transition support into Pierce and Thurston county workforces for military members and their families, military retirees, and veterans;
   b. Support for economic development organizations and initiatives that focus on leveraging the military and related business opportunities to help create jobs and expand defense and homeland security related economic development activity in the South Sound.
5. Adopt processes, similar to those already in place for artillery firing notices, to ensure that the military installations provide timely advance notification of operations which are likely to impact other partner members, and that other partner members provide the same courtesy to the military installations.
6. Discuss and potentially act upon other issues or matters that the SSMCP deems essential to fulfilling its purpose.

IV. Responsibilities:

1. Maintain a vision, organizational structure, brand, and a Work Plan for the Partnership consistent with the recommendations and strategies identified in the GCP and subsequent documents as well as other SSMCP priorities.
2. Form Working Groups (WGs) that support the Partnership and the implementation of the recommendations in the GCP. Consider stakeholders involved in the ten Expert Panels of the GCP effort for these working groups, but also be open to new stakeholders.
3. Develop and commit to a schedule of regular meetings for the Partnership and the WGs.
4. Hold an annual public forum ~~open to all members~~ that includes speakers from JBLM, ~~and~~ regional stakeholders, and/or any other relevamt organizations to share news; report on major changes at JBLM, Camp Murray, ~~–~~and in local jurisdictions; discuss progress on GCP strategies, SSMCP priorities and other plans; network among current and seek new SSMCP members; recognize outstanding service; and celebrate new partnerships and programs.

5. Hold one or more member-exclusive events (in person, via social media, etc.) annually during which data concerning progress and information about JBLM, Camp Murray, and SSMCP priorities would be shared (including, for instance, actual and projected military-connected (active duty, civilian employee, and military family(population and employment changes, construction projects, funding changes, mobilization and deployment, etc.)

~~5.~~6. Formalize a method for data sharing between JBLM and Camp Murray and the surrounding communities which would include the most recent military related population changes, including incoming personnel, deployments, Department of Defense (DoD) civilian operations, and construction projects.

~~6.~~7. Develop periodic memoranda, schedules or press releases to share with members regarding expansion/contraction of JBLM personnel, mobilization, and deployment.

~~7.~~8. Support information-sharing and appropriate advocacy with state and federal legislative bodies.

~~8.~~9. Accept an active role to ensure that GCP-related recommendations and other SSMCP priorities are funded and sustained through the foreseeable future.

V. Membership:

To ensure efforts of the Partnership are planned, coordinated, and implemented with a focus on outcomes, the structure of the SSMCP is as follows:

1. **General Members~~hip~~.**

   Role: The primary role of the general membership is to provide expertise, perspective and guidance to the Steering Committee on specific topics that promote the objectives of the SSMCP. Members will gather at least annually (more often, if necessary) to share best practices and receive information on changes at JBLM and Camp Murray, and in adjacent communities. They will also be encouraged to share their insights on existing conditions and growth trends; assist in the development of the GCP and other SSMCP priority implementation; and to review any studies, products, and other information developed by staff. Working Groups (WGs) will be established based on the strategies outlined in the GCP and on other topics of interest within the SSMCP membership. Each WG will select a spokesperson/chair that will serve on the Steering Committee to represent their strategy area/topic of interest. WG chairs will be expected to report on GCP strategy and SSMCP priority progress, and may also take new initiatives to the Steering Committee for consideration as part of the Partnership's annual work plan. The WGs already established include Transportation & Infrastructure (TI), Business & Development (BD), Social Services (SS), and Healthcare (HC).

   Participants: The Partnership is open to any person, association, group, or organization having an interest in the purpose and objectives of the SSMCP, and such will be considered a member upon payment of the annual dues established by the Steering Committee. The Partnership is intended to be as inclusive as necessary to address the numerous topical areas covered in the GCP and other SSMCP priorities.

   Benefits:

   a. Participate on one or more Working Groups of the member's choice;

   b. Participate in member-exclusive events and information sharing opportunities.

2. **Executive Leadership Team.**

   Role: The Executive Leadership Team (ELT) is operational in nature, overseeing the day-to-day work of Partnership staff, activities and budget and serving as a sounding board for staff on emerging issues, problems, and initiatives that may occur during the interval between meetings

of the full Steering Committee. The ELT is structured to promote timely and manageable communication and coordination between leadership and staff.

3. **Steering Committee.**
   Role: The Steering Committee (SC) is the foundation of the Partnership and the members are committed to remaining actively involved in the Partnership moving forward. The SC provides broad oversight to the implementation of the recommendations, strategies and action items outlined in the GCP and subsequent documents and identified as other SSMCP priorities. The SC ~~Committee~~ coordinates the work of assigned staff with members of the Partnership, helps develop an annual work plan to implement GCP strategies and other SSMCP priorities, approves the annual work plan, authorizes the annual budget, and is committed to ensuring that the SSMCP remains sustainable and has high value for the region. Finally, the SC is responsible for authorizing the creation of Working Groups (WGs) that reflect the needs, opportunities and intersection of military and community issues. Regular members will typically represent the local military installations, local and state governments, and affected service districts in the region. The SC shall meet as necessary, but not less than quarterly, in order to coordinate the activities of assigned staff and clarify issues, formulate strategies, and propose action plans.
4. **Elected Officials Council.**
   Role: The current Elected Officials Council (EOC) role and structure will be maintained to continue advocating for military issues of mutual concern in the south Puget Sound region.
   Participants: All elected leaders within Pierce and Thurston Counties, the surrounding cities and legislative districts are invited to attend EOC meetings, but a single representative from each governmental body is requested to represent their interests on the EOC. The EOC is ~~would continue to be~~ convened by the Mayor of Lakewood, the Pierce County Executive, and the Chair of the Thurston County Commissioners 2-3 times annually to receive updates on military and community issues, review the annual work plan, coordinate legislative strategies, and suggest outreach efforts to maintain a high level of visibility for these priorities. EOC meetings will conform to the Open Public Meetings Act of the State of Washington, 42.30 RCW.

VI. Funding:

There is a financial commitment required to participate in the Partnership. To ensure smooth and continuous operations ~~through~~ over time, it is desirable to structure for maximum financial stability. To that end, the dues for Executive Leadership team (ELT) and Steering Committee (SC) members are set based on the funds needed for pay, benefits, and program overhead for two full-time SSMCP staff members to focus on the work plan priorities established by the SC. Costs are also expected to include operations and administration, consultant efforts, and the commissioning of special studies as well as other activities as approved by the Steering Committee. Each year, in conjunction with preparation of the Annual Work Plan and Budget, dues will be calculated based on a methodology agreed to by a majority of the combined ELT and SC members. This commitment is outlined in Appendix A of this Agreement.

VII. Formation of Subcommittees:

The Partnership may be supported by technical experts, advisors, and community staff and leadership in various agency, jurisdictional, non-profit, and institutional capacities. Subcommittees will be formed by action of the SC as necessary to carry out the specific recommendations and strategies of the GCP or other SSMCP priorities.

VIII. Review/Changes:
The signatories (or their successors) will review this MOA periodically, but no less than annually. Proposed changes to this MOA will be in writing and shall be subject to approval in any event by the signatories or their successors.

IX. Effective Date and Termination:
This Agreement is effective when signed and shall remain in effect until terminated by a majority of the Steering Committee members in good standing. Any member partner may terminate its membership in the Partnership by providing no less than 30 days written notice to the Partnership of the desired termination date.

X. Indemnification:
Each Party shall defend, indemnify and hold each other harmless from any and all claims, demands, suits, actions, judgments, recoveries, liabilities, penalties, costs and expenses, including, but not limited to reasonable attorneys' fees, resulting from damage or bodily injury, including death, to the extent caused by a Party's breach of this Agreement or the negligent actions or omissions of that Party, or its employees, agents, or officers, elected or appointed. The foregoing indemnity specially covers actions brought by the Party's own employees, and each Party agrees that the foregoing indemnity is specifically and expressly intended to constitute a waiver of immunity under Washington's Industrial Insurance Act, RCW Title 51, but only as to the Party entitled to indemnity and only to the extent necessary to provide a full and complete indemnity as required under this Section. The indemnification obligation provided in this section shall survive the expiration or earlier termination of this Agreement for the duration of any applicable statute of limitations.

XI. Effect of Agreement:
This MOA is an internal agreement and does not confer any rights upon any individual or other entity. This MOA sets forth mutual goals and approaches. This MOA is not intended to create any rights, benefits, or other responsibilities, either substantive or procedural, nor is it enforceable as law or equity by a party against the U.S., its agencies, its officers, or any other person.

Nothing in this MOA shall obligate members to expend other monies or enter into any contract or other obligation. Nothing in the MOA shall be interpreted as limiting, superseding, or otherwise affecting the Parties' normal operations or decisions in carrying out their statutory or regulatory duties. This MOA does not limit or restrict members from participating in similar activities or arrangements with other agencies.

Signed, dated and acknowledged:

Pierce County	City of DuPont
City of Lacey	City of Lakewood
Town of Steilacoom	City of Tacoma

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City of University Place	Thurston Regional Planning Council
Thurston County	City of Yelm
Nisqually Indian Tribe	Washington Military Department, Camp Murray
Washington State Department of Transportation	Tacoma-Pierce County Chamber of Commerce
United Way Pierce County	Joint Base Headquarters, Joint Base Lewis-McChord
Tacoma Pierce Co. Department of Health	

~~Pierce County~~	~~City of Lacey~~
~~City of Lakewood~~	~~Joint Base Headquarters, Joint Base Lewis-McChord~~
~~City of DuPont~~	~~Thurston County~~
~~City of Tacoma~~	~~Town of Steilacoom~~
~~City of Yelm~~	~~Thurston Regional Planning Council~~
~~Nisqually Indian Tribe~~	~~Washington Military Department, Camp Murray~~

DRAFT

~~Tacoma - Pierce County Chamber of Commerce~~

~~Washington State Department of Transportation~~

~~United Way of Pierce County~~

DRAFT

EXHIBIT A

Membership and Annual Financial Commitment

The Executive Leadership Team (ELT) will be comprised of the following members:

1. City of Lacey
2. City of Lakewood
3. Pierce County
4. Joint Base Lewis-McChord Headquarters (advisory only)

The chief appointed official from each of the local governments will represent their jurisdiction on the ELT. JBLM will be represented by the Joint Base Commander (JBC) and/or his Chief of Staff. ELT members will also be members of the Steering Committee, and on an annual rotating basis (or other arrangement) each member of the ELT will serve as chair of the Steering Committee at the regular monthly meeting.

The Steering Committee (SC) will be comprised of regular members and Working Group (WG) Chairs. Regular members will consist of government representatives from the following:

1. City of DuPont
2. City of Tacoma
3. City of University Place
~~3.~~4. City of Yelm
~~4.~~5. Nisqually Tribe
~~5.~~6. Joint Base Lewis-McChord Headquarters
~~6.~~7. Thurston County
~~7.~~8. Thurston Regional Planning Council
~~8.~~9. Town of Steilacoom
~~9.~~10. Washington Military Department (Camp Murray)

The chief appointed official from each of the local governments will represent their jurisdiction on the SC.

~~The SC will also include a representative from each of the~~ Working Groups (WG) ~~that comprises~~ consist of the numerous public and private sector interests in our region that interact with JBLM and Camp Murray. ~~The~~ WG C~~c~~hairs will be the chief appointed officials or their designees from the following:

1. Tacoma-Pierce County Chamber (as Chair of the Business and Development WG)
2. United Way of Pierce County (as Chair of the Health and Social Services WG)
3. Washington State Department of Transportation (as Chair of the Transportation WG).
4. If needed, other WGs will be formed at the request of the SC, and Chairs will be appointed accordingly.

Financial Commitments

Financial commitments are tiered based on level of involvement, as follows:

1. Executive Leadership Team (ELT): City of Lacey $20,000, City of Lakewood $50,000, Pierce County $50,000.
2. Steering Committee: $6,500 annually unless this amount is prohibited by law, regulation, or local policy.

DRAFT

3. Working Group (WG) Chairs: ~~may be from nongovernmental entities. Their contribution will each be~~ $2,500 annually for as long as they actively chair a WG.
4. General Members: ~~General member dues are~~ $500 annually.

Membership costs may be reduced through in-kind donations with advance approval of the majority of SC members in good standing. An example of an acceptable in-kind donation is staff time dedicated to SC Work Plan priorities that is significantly above and beyond that expected of all SC members in their role on the SC.

The City of Lakewood will act as the fiduciary agent for the SSMCP and will be responsible for invoicing the members pursuant to this agreement.

Invoicing

After signature, members will be invoiced for ~~2014~~ annual membership fees. Invoicing will begin in October of the preceeding year. Membership fee payment that is not received by February 1~~, 2014~~ will be considered late and will suspend the member's meeting attendance and voting privileges. A member's good standing will be reinstated upon receipt of the full membership fee.

Annual fees shall be prorated on a monthly basis during the first year for members who join after January 1 of that year; such members will pay full fees in subsequent years.

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SOUTH SOUND MILITARY & COMMUNITIES PARTNERSHIP

MEMORANDUM OF AGREEMENT

This agreement is made between the undersigned parties and hereto it is agreed as follows:

I. Establishment:
This Memorandum of Agreement (MOA) establishes the structure, roles and responsibilities of the South Sound Military & Communities Partnership (SSMCP, or the Partnership). This MOA supersedes previous SSMCP MOAs.

II. Purpose:
The Partnership provides a framework for collaboration in the south Puget Sound region between local governments, military installations, State agencies, and Federal agencies to better coordinate efforts in areas such as: military relations; transportation and land use planning; environmental protection; emergency preparedness; data coordination; funding requests (e.g., grant applications); health care coordination; population forecasting; workforce development; education; housing; community development; economic development; and other issues that may arise. The Partnership provides actionable recommendations to regional leaders on initiatives, programs, and topics that strengthen the role that Joint Base Lewis-McChord (JBLM), the National Guard, and Reserves play in America's defense strategy and the economic health and vitality of the region and the State of Washington. The Partnership:

a. Focuses on the intersection of issues between local governments and the military community, engaging the support of the business, healthcare, education, workforce development, and social services communities;
b. Assists in the coordination of governmental efforts so that all citizens of the community can receive the full benefits of the economic, civil, commercial, cultural, and educational opportunities presented to them, and so that the impact of the military community will be fairly shared;
c. Promotes the general welfare of the region;
d. Acts on behalf of the members as the regional organization recognized by the Federal government for applying for community assistance and grants related to mission changes and/or growth at JBLM and Camp Murray;
e. Coordinates state and federal legislative educational and advocacy efforts by members and SSMCP staff related to the promotion of common interests as approved by the Steering Committee; and
f. Acts as the regional representative of the member governments to coordinate with JBLM and Camp Murray regarding the ability of each installation to accomplish its current and future projected mission.

III. Objectives:

1. Work collaboratively to create, expand, and improve opportunities to collect and disseminate information and best practices that address the challenges of the local communities, residents,

businesses, and military installations in our region to succeed in meeting their own needs without preventing the others from meeting their needs, both now and in the future. Specifically:

   a. Coordinate and provide recommendations to the region's leaders to remedy and protect JBLM and Camp Murray from encroachment or other initiatives that could result in degradation of or restriction to military operations on or based out of JBLM and Camp Murray.
   b. Notify the local military installations of development proposals or other projects in the surrounding communities that may impact military operations.
2. Coordinate with commanders, communities, and State and Federal agencies on affairs that affect the installation and may require State coordination and assistance.
3. Serve as a "single point of contact" to ensure that communities, the military, Washington State's congressional delegation, and other Federal agencies, as appropriate, are fully aware of activities likely to result in impacts or benefits to the region.
4. Support efforts by agencies and service providers in the region to implement the recommendations and strategies of the 2010 JBLM Growth Coordination Plan (GCP) and more recently identified SSMCP priorities, which include:
   a. A sound infrastructure system, adequate housing and education, and transition support into Pierce and Thurston county workforces for military members and their families, military retirees, and veterans;
   b. Support for economic development organizations and initiatives that focus on leveraging the military and related business opportunities to help create jobs and expand defense and homeland security related economic development activity in the South Sound.
5. Adopt processes, similar to those already in place for artillery firing notices, to ensure that the military installations provide timely advance notification of operations which are likely to impact other partner members, and that other partner members provide the same courtesy to the military installations.
6. Discuss and potentially act upon other issues or matters that the SSMCP deems essential to fulfilling its purpose.

IV. Responsibilities:

1. Maintain a vision, organizational structure, brand, and a Work Plan for the Partnership consistent with the recommendations and strategies identified in the GCP and subsequent documents as well as other SSMCP priorities.
2. Form Working Groups (WGs) that support the Partnership and the implementation of the recommendations in the GCP. Consider stakeholders involved in the ten Expert Panels of the GCP effort for these working groups, but also be open to new stakeholders.
3. Develop and commit to a schedule of regular meetings for the Partnership and the WGs.
4. Hold an annual public forum that includes speakers from JBLM, regional stakeholders, and/or any other relevant organizations to share news; report on major changes at JBLM, Camp Murray, and in local jurisdictions; discuss progress on GCP strategies, SSMCP priorities and other plans; network among current and seek new SSMCP members; recognize outstanding service; and celebrate new partnerships and programs.
5. Hold one or more member-exclusive events (in person, via social media, etc.) annually during which data concerning progress and information about JBLM, Camp Murray, and SSMCP priorities would be shared (including, for instance, actual and projected military-connected (active duty, civilian employee, and military family(population and employment changes, construction projects, funding changes, mobilization and deployment, etc.)

6. Formalize a method for data sharing between JBLM and Camp Murray and the surrounding communities which would include the most recent military related population changes, including incoming personnel, deployments, Department of Defense (DoD) civilian operations, and construction projects.
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8. Support information-sharing and appropriate advocacy with state and federal legislative bodies.
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1. **General Members.**

   Role: The primary role of the general membership is to provide expertise, perspective and guidance to the Steering Committee on specific topics that promote the objectives of the SSMCP. Members will gather at least annually (more often, if necessary) to share best practices and receive information on changes at JBLM and Camp Murray, and in adjacent communities. They will also be encouraged to share their insights on existing conditions and growth trends; assist in the development of the GCP and other SSMCP priority implementation; and to review any studies, products, and other information developed by staff. Working Groups (WGs) will be established based on the strategies outlined in the GCP and on other topics of interest within the SSMCP membership. Each WG will select a spokesperson/chair that will serve on the Steering Committee to represent their strategy area/topic of interest. WG chairs will be expected to report on GCP strategy and SSMCP priority progress, and may also take new initiatives to the Steering Committee for consideration as part of the Partnership's annual work plan. The WGs already established include Transportation & Infrastructure (TI), Business & Development (BD), Social Services (SS), and Healthcare (HC).

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   Benefits:

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   Role: The Executive Leadership Team (ELT) is operational in nature, overseeing the day-to-day work of Partnership staff, activities and budget and serving as a sounding board for staff on emerging issues, problems, and initiatives that may occur during the interval between meetings of the full Steering Committee. The ELT is structured to promote timely and manageable communication and coordination between leadership and staff.

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   Role: The current Elected Officials Council (EOC) role and structure will be maintained to continue advocating for military issues of mutual concern in the south Puget Sound region.

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agreed to by a majority of the combined ELT and SC members. This commitment is outlined in Appendix A of this Agreement.

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Signed, dated and acknowledged:

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City of Lacey	City of Lakewood
Town of Steilacoom	City of Tacoma
City of University Place	Thurston Regional Planning Council
Thurston County	City of Yelm
Nisqually Indian Tribe	Washington Military Department, Camp Murray
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3. Working Group (WG) Chairs: $2,500 annually for as long as they actively chair a WG.*
4. General Members: $500 annually.

Membership costs may be reduced through in-kind donations with advance approval of the majority of SC members in good standing. An example of an acceptable in-kind donation is staff time dedicated to SC Work Plan priorities that is significantly above and beyond that expected of all SC members in their role on the SC.

**As approved by the Steering Committee, in 2015, the Tacoma-Pierce County Department of Health shall pay $500 and donate in-kind effort by its representative to cover its WG Chair costs.*

The City of Lakewood will act as the fiduciary agent for the SSMCP and will be responsible for invoicing the members pursuant to this agreement.

Invoicing

After signature, members will be invoiced for annual membership fees. Invoicing will begin in October of the preceding year. Membership fee payment that is not received by February 1will be considered late and will suspend the member's meeting attendance and voting privileges. A member's good standing will be reinstated upon receipt of the full membership fee.

Annual fees shall be prorated on a monthly basis during the first year for members who join after January 1 of that year; such members will pay full fees in subsequent years.

SOUTH SOUND MILITARY &
COMMUNITIES PARTNERSHIP
6000 Main St SW, Lakewood, WA 98499 | www.ssmcp.org

City of DuPont
City of Lacey
City of Lakewood
City of Tacoma
Clover Park School District
Joint Base Lewis-McChord
Pierce County
Pierce County Health Department
Tacoma-Pierce County Chamber of Commerce
Thurston County
Thurston Regional Planning Council
United Way-Pierce County
Washington State Department of Transportation
Washington State Military Department

November 21, 2014

Scott Spence, City Manager
City of Lacey
420 College Street
Lacey, WA

Dear Mr. Spence:

On behalf of the South Sound Military & Communities Partnership (SSMCP), we would like to thank the City of Lacey for its participation and financial support at the Executive Leadership Team (ELT) level. This letter is to encourage Lacey's continuing and enhanced involvement in the SSMCP.

The mission of the SSMCP is to foster effective communication, understanding, and mutual benefit by establishing the most effective point of coordination for resolution of those issues which transcend the specific interest of the military and civilian communities of the South Sound Region.

The Executive Leadership Team (ELT) is operational in nature, overseeing the day-to-day work of Partnership staff, activities and budget and serving as a sounding board for staff on emerging issues, problems, and initiatives that may occur during the interval between meetings of the full Steering Committee. The ELT is structured to promote timely and manageable communication and coordination between leadership and staff. Thank you for your service as Vice-Chair of the ELT in 2014.

Since its establishment, the SSMCP has issued and begun implementation of strategies within the JBLM 2010 Growth Coordination Plan that address economics, housing, education, land use, public safety, utilities, health care, social services, and quality of life issues. You can view the Plan at www.ssmcp.org.

SSMCP has also issued two Preferences Surveys of JBLM active duty and civilian personnel to raise awareness in local communities of the impact JBLM has in the area, strengthen local communities' ties with JBLM, and bolster the level of service desired by service members off base. It is the intent that these surveys will be issued every two years to keep information accurate and timely for best use by South Sound cities and counties.

For instance, please consider the following facts gleaned from the 2013 Preferences Survey regarding the impact of JBLM on the City of Lacey:

- Lacey has the highest percentage of Active Duty residents - 10.6% or 3,429 individuals, not including their families - of any Pierce or Thurston County city jurisdiction; this translates into 7.7% of the city's population, or 1 of every 13 Lacey residents, being an active duty Service Member.
- 87% of Active Duty respondents living off base do not live alone; 59% live with three or more people.

- The median annual household income range for Active Duty ranges between $50,000 and $74,999.
- 30% of the Active Duty respondents are transitioning out of service by the end of 2015; of those, 45% plan to stay in the Puget Sound region.

Source: SSMCP Military Preferences and Needs Survey

Priorities being set for the SSMCP in its 2015-16 Work Plan include:

- Task 1 – Complete the Joint Land Use Study
- Task 2 – Monitor and Support Transportation Improvement Efforts in JBLM Corridor
- Task 3 – Enhance and Expand Regional SSMCP Coordination & Participation
- Task 4 – Improve Outside Knowledge of Military's Direct and Indirect Impact on Region and State and Vice Versa
- Task 5 – Participate and Advocate in State Level Legislative and Funding Activities
- Task 6 – Conduct Periodic JBLM Community Survey, Circulate Results
- Task 7 – Support Active Duty, Veteran and Military Family Workforce Development, Health and Social Services

As the south sound city with the highest population of Active Duty service members, Lacey both affects and is affected by Joint Base Lewis McChord (JBLM), and it is vital that the city is fully engaged in efforts by the SSMCP. Per the SSMCP Memorandum of Agreement, members of the SSMCP's Executive Leadership Team (ELT) have financial commitments of $50,000. However, Lacey paid $20,000 in 2014. The SSMCP values Lacey's input and would hope that Lacey sees the value in participating at the $50,000 level as well; this letter is to request that the city increase its financial commitment to $30,000 in 2015 and then to $50,000 in 2016.

Please feel to contact me (253.983.7703 / jcaulfield@cityoflakewood.us) or Tiffany Speir, SSMCP's Program Manager (253.983.7772 / tspeir@cityoflakewood.us), with any questions. We look forward to hearing from you soon.

Sincerely,

John Caulfield, Manager, City of Lakewood
2014 SSMCP ELT Chair

LACEY CITY COUNCIL WORKSESSION
January 15, 2015

SUBJECT: **Street Tree Ordinance—Proposed LMC 12.20**

RECOMMENDATION: Review the Planning Commission's recommendation to the City Council. The referral from the Planning Commission will be considered by the full Council at a future regular Council meeting.

STAFF CONTACT: Scott Spence, City Manager
Rick Walk, Community Development Director
Scott Egger, Public Works Director
Ryan Andrews, Planning Manager

ORIGINATED BY: Community Development and Public Works Departments

ATTACHMENTS: 1. Planning Commission Record

FISCAL NOTE: See analysis in staff report.

PRIOR REVIEW: April 1, 2014 Planning Commission Public Hearing
March 18, 2014 Planning Commission Briefing
December 17, 2013 Planning Commission Briefing
November 5, 2013 Planning Commission Briefing

BACKGROUND:

The City of Lacey has never had a consolidated set of regulations pertaining to street trees and their maintenance. In the past, regulations have been split between the City's Development Guidelines and Public Works Standards and the tree protection regulations contained in Lacey Municipal Code 14.32. This has caused confusion in the application of regulations and enforcement. This situation was recently memorialized in the 2013 update to the Urban Forest Management Plan (UFMP) which states:

"…there have been challenges with maintenance responsibilities for street trees between the City and adjacent property owners. The City's policy has been to maintain street trees on select City arterials, commercial areas, and City transportation projects and adjacent property owners or owners associations maintain the remainder. However, this has not

been evenly applied across the board and there is some confusion between adjacent property owners and the City as to who has the maintenance responsibilities. The street tree inventory completed in 2012 addressed some of the issues as it provided a map of all City-maintained trees in Lacey and will therefore provide better information delivery to the public. The City currently lacks an ordinance related to street tree maintenance and may benefit from developing one in the future. Such an ordinance would provide additional clarity and consistency when it comes to maintenance responsibilities."

To further address the lack of City regulations pertaining to street trees and their maintenance, goals and policies within the UFMP supports development of a street tree program and regulations as an essential part of Lacey's Urban Forestry Plan.

To address the lack of regulations and the confusion regarding maintenance issues, City staff members including both the Community Development and Public Works Departments have collaborated to develop the draft street tree regulations. The key elements of the regulations include:

- Identifying the City's Public Works Department as having the authority to regulate street trees including issuing permits for tree removal or pruning of more than 30% of the canopy of a tree.
- Establishing maintenance standards including requiring trees in the right-of-way to be those identified in the Development Guidelines & Public Works Standards, prohibiting tree topping, and clarifying property owner responsibilities along and fronting City rights-of-way.
- Setting standards for trees on private property adjacent to the right-of-way that may affect public safety or tree health within the right-of-way.
- Establishing procedures related to nuisances and enforcement.

Since these regulations will be administered by the Public Works Department, they will be contained in Chapter 12—Streets and Sidewalks of the municipal code and not in LMC 14.32 which contain tree regulations administered on private property by Community Development.

At the Planning Commission's meeting on November 5, 2013, staff provided a briefing on the proposed street tree ordinance. At the briefing, the Planning Commission raised concerns related to equity between the City's past maintenance responsibilities and perceived benefits to certain residents where the City maintains trees versus those developments where all trees are privately maintained. In response, staff prepared an issue paper (see attached) that provides additional background related to past and existing codes and policies, current and future funding sources for right-of-way maintenance, maintenance challenges, and the street tree inventory completed in 2012.

At the December 5, 2013, meeting, the Planning Commission continued the discussion and reiterated their concerns related to equity, the City's legal authority to require property owners adjacent to the right-of-way to maintain trees and landscaping in those areas, and whether requiring maintenance by adjacent property owners is an undue tax.

To assist the Planning Commission in moving the issue forward, staff prepared three alternatives for the regulations which were reviewed at the March 18, 2014, meeting: the City maintains all trees it currently maintains as well as any added as part of a transportation project (staff recommended proposal); the City maintains all trees on arterials and collectors; or establishing a dedicated fund by raising taxes for wholesale maintenance of trees throughout the City.

Option A: Staff Proposal

The staff-recommended proposal would essentially maintain the status quo related to street tree maintenance. This means that the city will maintain all trees that are currently maintained as well as any tree that is installed as part of a city transportation project. Currently, the City maintains a total of 2,973 trees at a cost of approximately $65,000 annually for labor and materials. Most trees that the City maintains were installed as part of previous transportation-related improvement project.

The Planning Commission raised concerns about equity related to this option. A majority of the Planning Commission cited that it shifts maintenance and replacement of street trees located on arterials and collectors onto adjacent property owners. The issues associated with this option include:

- Burden to homeowners and HOA's to administer and collect for maintenance of trees.
- Homeowners and HOA's usually are not knowledgeable about proper pruning techniques, additional traffic control needed along busy streets, or the need to call for utility locates.
- Lack of homeowner/HOA knowledge about city policies.
- Lack of resources available if a homeowner is elderly or disabled.

The benefits of this proposal include:

- Keeps the status quo.
- Keeps the budget distribution to existing General Fund programs the same. If more funds are required for an enhanced street tree program, funds to other existing essential services such as street maintenance, park services or facilities maintenance will have to be reduced in kind.

Option B: City Maintenance of all Arterials and Collectors

An option to be considered would be to recommend that the city maintains street trees on all arterials and collectors. Currently, most of the trees the city maintains are on arterials and collectors. However, there are some key corridors where the city currently does not provide maintenance including Yelm Highway, Rainier Road, Marvin Road, Hawks Prairie Road and Willamette Drive. According to estimates prepared by the Public Works Department, the additional cost to maintain these 2,051 trees would be approximately $150,000 per year for labor and materials. In addition upfront costs for a bucket truck/chipper combination would be approximately $300,000 with yearly depreciation and maintenance costs of approximately $40,000.

The key issues related to this proposal are related to additional cost by the city. Should this be the preferred recommendation, the additional $150,000 per year would take budgeted funds from the general fund and would necessitate the need to reduce funding and level of service delivery within other current general fund categories. The issues associated with this option include:

- Higher cost for the city that may take budget funds from other services or programs.
- Additional notification and outreach would be needed to inform the public in the change of policy.

The benefits of this proposal include:

- Regular maintenance of trees along city corridors and gateways that provide an overall aesthetic benefit to the city.
- Professional, qualified crews working within the right-of-way that will prevent issues associated with residents doing work in these high traffic areas.

Option C: City Establishes a Dedicated Fund to Maintain All Trees

The final option would be for the City to establish a dedicated fund to maintain all trees in the city. This could be done by raising taxes or other concept whereby residents are taxed for the benefit of the city maintaining all trees.

At this point, a ballpark estimate for the total number of trees in the city along all streets would be in the neighborhood of 20,000 to 30,000 trees. At our current budget rate, this means that the total cost of maintaining all trees would be approximately $437,269 to $655,903 per year not including any up-front costs such as equipment, etc. There are currently 16,949 households in the City of Lacey. That means that each household would be responsible for paying approximately $26 to $39 per year for street tree maintenance. These numbers are just a guide and could shift based on the exact number of trees in the city and the amount of annual maintenance required. Additionally, not every property in Lacey has street trees—meaning that some residents would be paying for a service that they would not directly benefit from. The issues associated with this option include:

- May be difficult to enact a tax based on voter preferences.
- Would potentially be a hardship for those who are on a limited budget.
- This type of program would require additional operations staffing and equipment as well as requiring additional staff time to administer.

The benefits of this proposal include:

- Regular maintenance of trees along city corridors, gateways, and within neighborhoods that provide an overall aesthetic benefit to the city, not only within commercial areas and corridors, but also within neighborhoods.
- Professional, qualified crews working within the right-of-way that will prevent issues associated with residents doing work in high traffic areas and within neighborhoods.
- Potential for increased property values because of improvement to street frontages and the public realm within neighborhoods.

The Planning Commission held a public hearing on April 1, 2014. Several members of the public spoke and generally favored option two for the City to maintain all trees on arterials

and collectors. After considering public testimony and staff's recommendation, the Planning Commission ultimately voted 7 to 2 to recommend the proposed street tree regulations LMC 12.20 to the Council with a recommendation to adopt Option B—the City maintains all trees on arterials and collectors. The majority of the Planning Commission preferred this option because it would eliminate the equity issues associated with Option A.

ADVANTAGES:

1. The ordinance would provide additional clarity and consistency when it comes to maintenance responsibilities for street trees along the city's major corridors.
2. Option B will provide regular maintenance of trees along city corridors and gateways that provide an overall aesthetic benefit to the city.
3. Option B will provide for professional, qualified crews working within the right-of-way that will prevent issues associated with residents doing work in these high traffic areas.

DISADVANTAGES:

1. Option B will require additional funds to be dedicated to street tree maintenance. This will necessitate the need to reduce funding and level of service standards with other essential services within the general fund.

STREET TREE ORDINANCE LANGUAGE

April 1, 2014 Planning Commission Recommendation Draft

12.20.010 INTENT

This chapter establishes regulations and standards necessary to ensure that the City continues to realize the benefits provided by maintaining safe travel ways and a healthy urban forest. This chapter is intended to:

A. Maintain trees located in the public rights-of-way in a healthy, non-hazardous condition through the application of tree care standards contained in ANSI A300 standards.
B. Provide guidance for the planting, maintenance and protection of trees located within the city right-of-ways.
C. Remove diseased, hazardous and or nuisance trees located either within the public right-of-way or on adjacent private property that poses a risk to the general public health, safety and welfare.

12.20.020 PERMIT REQUIRED

A. A right-of-way access permit shall be obtained from the City Public Works Department prior to the planting, major pruning (more than 30% of the canopy), or removal of any street tree within the City. A separate permit is required for each work location. No permit is required for normal and minor pruning (less than 30% of the canopy) of street trees.
B. A land clearing permit or exemption shall be obtained from the City Community Development Department in accordance with LMC 14.32 prior to the removal of any tree from private property.

12.20.030 STANDARDS FOR TREES LOCATED IN THE RIGHT-OF-WAY

A. Maintenance: The fronting property owner (commercial, industrial, residential) and or owner/community association is responsible for mowing, pruning, weeding, watering, replacement (due to death, damage or disease as determined by the City Forester) and any other tree, shrub, groundcover maintenance, and tree grate within the respective right-of-way and common areas. Landscaping shall be maintained per ANSI A300, Standard Practices for Trees, Shrubs and other Woody Plant Maintenance.

   OPTION A: The City of Lacey will only maintain street trees that were or are planted as part of a City-funded transportation project. In addition, trees that are being maintained by the City on the effective date of this ordinance will continue to be maintained.

   OPTION B: The City of Lacey will maintain street trees that are located along arterials and collectors as identified in the map labeled as "Functional Classification of Roadways" in the City of Lacey Transportation Plan. Additionally, the City of Lacey will maintain street trees that were or are planted as part of a City-funded transportation project and any trees that are being maintained by the City on the effective date of this ordinance.

   OPTION C: The City of Lacey will maintain all street trees located within the city limits.

B. Street tree varieties to be planted: All trees within the right-of-way shall be planted in accordance with Section 4G.100 of the City of Lacey Development Guidelines and Public Works Standards including species, size, location, etc. Any alternate species shall not be used unless approved by the City Forester.

Comment [RA1]: Planning Commission recommended Option B.

STREET TREE ORDINANCE LANGUAGE

April 1, 2014 Planning Commission Recommendation Draft

C. Tree topping: It is unlawful for any person or city department to top any street tree, park tree or other tree on public property. Trees severely damaged by storms or other causes, or certain trees under utility wires or other obstructions where other pruning practices are impractical, may be exempted from this chapter at the determination of the City Forester.

D. Property owner responsibilities: Property owners and or community associations shall have the following responsibilities regarding street trees within the property owner's portion of right-of-way fronting their property:

1. Dead and severely-damaged street trees: Dead or severely-damaged street trees shall be removed and replaced.
2. Hazard trees: Hazardous street trees shall be removed or pruned. In the event of removal, the street tree shall be replaced.
3. Right-of-way obstructions: Street trees shall be maintained so that they do not obstruct the free use of the right of way, Including, but not limited to, clearance for sight visibility, traffic signage and signals, as well as pedestrian and vehicular use of streets and sidewalks.
4. Protection of utilities, streets, and sidewalks: Street trees shall be planted and maintained so that they do not damage utilities, streets or sidewalks.
5. Improperly pruned street trees: No person may engage in improper pruning of street trees. The City Forester may require a property owner to remove and replace improperly pruned street trees, if the improperly pruned street tree will not be able to achieve its mature size or full environmental function.
6. Clean right-of-way: The right-of-way shall be kept reasonably clean from street tree debris, including, but not limited to, branches, leaves, flowers, and fruit.
7. Disease or insect infestations: Street trees shall be maintained free of disease or insect infestation. Street trees that are infected with disease or insects shall be replaced, if deemed necessary by the City Forester.

12.20.040 STANDARDS FOR TREES ON PRIVATE PROPERTY

A. Responsibilities of Adjacent Property Owners:
Any person, persons, community association or corporation in possession of private property adjacent to public rights-of-way shall maintain any trees upon private property which may affect public right-of-way, in a safe, healthy condition in compliance with the provisions of this Chapter. Adjacent property owners have the following routine tree maintenance responsibilities:

1. Removal or pruning of trees located on the owner's private real property that is considered a public nuisance as defined in 12.20.050.A.;
2. Pruning of trees located on the owner's private real property that are considered a public nuisance as defined in 12.20.050.A. Branches that overhang sidewalks or streets shall be pruned to provide sufficient vertical clearance over the sidewalk and street so as not to interfere with public travel; sidewalk clearance shall be 10 feet high and road clearance shall be 14 feet high. Control of pests on trees located on the owner's private real property which may, upon determination by the City Forester, pose a threat to public trees;
3. Removal of all debris (wood, branches & leaves) from public property by sunset of the day on which any tree work is done.

STREET TREE ORDINANCE LANGUAGE

April 1, 2014 Planning Commission Recommendation Draft

B. Tree topping.
It is unlawful for any person or city department to top any tree on private property. Trees severely damaged by storms or other causes, or certain trees under utility wires or other obstructions where other pruning practices are impractical, may be exempted from this chapter at the determination of the City Forester.

12.20.050 NUISANCES

A. Public Nuisances.
The following are hereby declared public nuisances under this Chapter:
1. Any tree or part thereof (public or private) which, by reason of location or condition, constitutes a hazard to public safety as determined by the City Forester or authorized City representative,
2. Any tree or part thereof (on public or private property) which obstructs the free passage of pedestrian or vehicular traffic or which obstructs public street lighting;
3. Any tree or alternate host plant or part thereof (on public or private property) which harbors pests which reasonably may be expected to injure or harm public trees.

B. Abatement of Public Nuisances.
The following are the prescribed means of abating public nuisances under this Chapter:
1. Any tree or alternate host plant or part thereof (public or private) declared to be a public nuisance by the city shall be pruned, removed or otherwise treated as directed by the city. All costs for nuisance abatement are the responsibility of the property owner or adjacent property owner;
2. The City may cause a written notice to be personally served or sent by mail to the owner of the particular property;
3. In the event the nuisance is not abated by the date specified in the notice, the City is authorized to cause the abatement of said nuisance. The reasonable cost of such abatement may be charged to the subject property owner. Monies which have not been recovered through the City bill-collection procedures may result in a lien against the property or assessed on taxes. In addition, the owner of the property upon which the nuisance is located may be subject to prosecution by the city. Nothing in this provision shall be construed to exempt any person from the requirement of obtaining permits.
4. The City is empowered to cause the immediate abatement of any nuisance if it is determined by the City to be an emergency or immediate hazard to public safety;
5. If the City Forester determines that disposal of the wood, branches and soil from removal or pruning of a nuisance tree is required to complete abatement, such disposal shall be done as required by the City. All costs associated with the disposal of material from private trees shall be the responsibility of the property owner.

C. Appeals of Nuisances: Any appeals of a nuisance determination by the City shall be processed by the city's hearings examiner pursuant to the provisions of LMC 2.30 and Section 1D "Appeals" of the Development Guidelines and Public Works Standards. Any appeals shall be filed within 14 days of the nuisance determination. Nuisance determinations in cases of immediate abatement related to an emergency or immediate hazard to public safety are not appealable.

STREET TREE ORDINANCE LANGUAGE

April 1, 2014 Planning Commission Recommendation Draft

12.20.060 PUBLIC TREE CARE
The city shall have the right, but not the obligation, to plant, prune, maintain and remove such trees, plants and shrubs within the lines of all streets, alleys, avenues, lanes, squares as may be necessary to ensure public safety or to preserve or enhance the symmetry and beauty of such public grounds.

12.20.070 ENFORCEMENT
The City Public Works Department shall have the authority to enforce the provisions of this chapter as it relates to trees located within the public right-of-way or any tree located on private property that poses a risk, hazard or nuisance to the public right-of-way.

MINUTES
Lacey Planning Commission Meeting
Tuesday, April 1, 2014 – 7:00 p.m.
Lacey City Hall Council Chambers, 420 College Street SE

Meeting was called to order at 7:00 p.m. by Gail Madden.

Planning Commission members present: Gail Madden, Mike Beehler, Carolyn Cox, Vasiliy Stupin, Cathy Murcia, Paul Enns, Albert deSantis, Rebecca Lee, and Carolyn St. Claire. Staff present: Rick Walk, Ryan Andrews, Scott Egger, Tom Palmateer, Martin Hoppe, Roger Schoessel, and Leah Bender.

Gail Madden noted a quorum present.

Vasiliy Stupin made a motion, seconded by Carolyn Cox, to approve the agenda for tonight's meeting. The motion carried. There were no corrections or amendments to the March 18 minutes.

1. **Public Comments:** None.

2. **Commission Member's Report:** Cathy Murcia said she attended the first sign ordinance amendment committee meeting and found it interesting. Rick Walk said he will give the Director's Report following the public hearings.

3. **Public Hearings:**
   Capital Facilities Plan:
   - Ryan Andrews gave some background information and noted that the complete final version of the Plan was distributed to Planning Commissioners.
   - Tom Palmateer gave a brief overview on how the complete CFP is organized. Tom pointed out that the Plan is on the city website and the table of contents contains links to each section to ease navigating through the document. Tom also noted that a hard copy of the Plan is available to the public at the Lacey Library.
   - No public comment was given. Gail Madden closed the public hearing.
   - **Mike Beehler made a motion, seconded by Vasiliy Stupin, to refer the Plan to Council for adoption. All were in favor, the motion carried.**

   Street Tree Ordinance:
   - Ryan went over the public outreach methods staff employed to get the word out for this public hearing.
   - Ryan explained that in the past there has not been a consolidated set of regulations regarding permits and maintenance. Staff from Community Development and Public Works collaborated to come up with this draft ordinance.
   - In previous discussion of this ordinance, Planning Commission has raised concerns related to equity.
   - Ryan went over the three options staff has offered and reiterated that option one is preferred by staff.
   - Gail asked for public comments.
   - Teresa Hammer testified. She stated that she owns Ammerstone Association Management and works with several owners associations. Ms. Hammer offered the following observations and suggestions:
     - HOAs are inheriting problems from developers. Too many trees and/or inappropriate trees are planted and then must be maintained by the owners. Not everyone agrees that trees are an asset. Perhaps the ordinance could reflect that maintenance is an inherited problem.
     - The word "shall" could be used more carefully.
     - Identify what is owned by whom.
     - Identify who owns and who maintains frontage property to avoid future problems.
     - If developers were required to plant fewer trees, it would help avoid future problems and expense for owners.
     - If option one is chosen, it would be helpful to phase it in so as not to create a huge responsibility for the owners.
     - It would be helpful to owners if HOAs were allowed to remove more trees. Property owners already have a lot to maintain and developers put in too many trees.
   - Ron Lawson testified. He pointed out that street trees are expensive to maintain, and the leaves that fall in autumn create problems and more maintenance issues. Mr. Lawson suggested that a solution would be to remove all street trees and replace them with shrubs which require less maintenance and are cheaper. He recognized that street trees are considered a traffic calming measure but he disagrees with this.
   - Rebecca Lee asked Teresa Hammer about her experiences going through the process of removing trees.
     - Ms. Hammer gave an example of a neighborhood that had issues with street trees that were damaging the sidewalk. The trees had to be removed and replaced and it was very costly. She gave another example of the Cottages at Lakepointe that had problem birch trees on private property that caused a lot of damage during an ice storm. Per city regulations, a forester review was required; the forester evaluated the trees and stated that every other tree could be removed. That was a very costly process, the remaining trees are still causing problems and should be removed, but now the HOA does not have the funds available. She stated that it would have been easier if they could have taken out all the trees at the same time when they had sufficient funds to do so. Ms. Hammer

also noted that we need to figure out where boundaries are because there was an instance where an HOA was maintaining trees that did not actually belong to them.

- Cathy Murcia asked staff who is responsible for repairing sidewalks that are damaged by street trees. Ryan said that within the city right-of-way the city maintains and repairs damaged sidewalks.
- Vasiliy Stupin asked Ms. Hammer if most owner associations have sufficient tree maintenance programs. Ms. Hammer said they do not. She noted that, until recently, trees have not been included in HOA reserve studies.
- Rick Walk clarified that there are other ordinances in place that regulate trees and trees on private property and pointed out that tonight's hearing is in regards to the street tree ordinance and street trees in the public right-of-way.
- Ryan Andrews noted that we did receive written comments from one person who preferred option one.
- Mike Beehler expressed concern over the equity issue and said he is not satisfied with any of the options.
- Carolyn St. Claire said she likes both option one and two, and she feels that Council should make the decision.
- Vasiliy Stupin commended staff on the draft ordinance and the great outreach, tonight's turnout has been the best he's seen so far. He said he advocates option two and feels the city should go back to maintaining all trees along arterial and collector roads. He said that if option two is chosen, it will force Council to decide what the city's priorities are.
- Scott Egger clarified that the city has never maintained all trees and that the current practice is how it has always been done. Rick Walk noted that the reason for this draft is to reconcile this issue between past practice and adopted city policy and guidelines.
- Rebecca Lee said she feels option two is the most unequal, and that maintenance should be more equally dispersed so that everyone contributes and everyone benefits.
- Carolyn Cox supports option two and feels that option one would cause us to retreat from being a tree city.
- Cathy Murcia asked staff where the deficit comes from if option two is chosen. Scott Egger explained that it comes from the general fund and could result in the loss of a police officer or the loss of street maintenance. He reiterated that the city has not been offering a service that it is now retreating from.
- Rebecca asked if a credit system could be established. Rick said that type of program would be too difficult to maintain.
- Mike asked for clarification regarding trees taken over by the city as part of a street maintenance project. Ryan explained that only trees installed by the city because of a project are maintained by the city.
- Scott Egger explained that revenues have flatlined while the budget has increased, adding to the budget increases strain on the city and there is no leeway.
- Paul Enns said he appreciates the options that have been presented. He feels that option one really isn't good enough, option two has some issues, and option three seems better, but he would most likely support option two.
- Gail asked for clarification of city maintenance of trees due to traffic project and contiguous trees not included, causes confusion. Ryan said option two eliminates that confusion.
- Cathy noted that the city requires developers to put in so many trees and then owners associations have to maintain them – how is that addressed. Rick said that can be addressed separately with subdivision standards, development guidelines could be under a future work program. This would be a good topic to raise at the September joint meeting with Council.
- **Vasiliy Stupin made a motion, seconded by Paul Enns, to refer the ordinance to Council with option two provided that Planning Commission and Council have an in-depth discussion about the issues that have come up. Seven in favor, two opposed; the motion carried.**
- Rebecca and Cathy said they felt the issue should be discussed further as they are concerned about the financial burden it places on the city and programs that would have to be cut.
- Vasiliy and Carolyn St. Claire stated that Council will make the final decision.
- Albert de Santis pointed out that option one continues the current level of service and doesn't create a financial burden on the city. He suggested looking at the wording to clarify the details of responsibility.
- Public hearing was closed.

Crossing Policy:

- Ryan gave some background information and reiterated that the policy was created as an interim measure until funding becomes available for a city-wide non-motorized plan as identified in the 2030 Transportation Plan.
- No public testimony was given.
- The Planning Commission commended the staff on the proposed policy and approach.
- **Vasiliy Stupin made a motion, seconded by Rebecca Lee, to refer the policy to Council. All were in favor, the motion carried.**
- Public hearing was closed.

4. **Director's Report:**
   - Rick reported that he attended the Board of County Commissioners public hearing regarding North Thurston Public Schools' request to amend the UGA to include a parcel off of Marvin Road NE to add a high school. This item is scheduled for a worksession with the Board on April 9.
   - Rick highlighted the new agenda format on the website that Leah had created and thanked her for the good work.
   - Rick noted that the sign ordinance committee meeting got off to a good start.

5. **New Business:**
   Gateway Town Center:
   - Rick gave a PowerPoint presentation outlining the history of the Gateway Town Center project.
   - Nisqually Tribe and Wig Properties purchased the property in 2012.
   - Rick went over what the next steps will be to complete the development of the project.

6. **Communications and Announcements:** None.

7. **Next meeting:** April 15, 2014.

8. **Adjournment:** 9:25 p.m.

Ryan Andrews

From: Glenn Briskin <g.briskin@comcast.net>
Sent: Tuesday, March 25, 2014 7:34 AM
To: Ryan Andrews
Subject: Trees

I like option 1.

Glenn Briskin
The Pointe HOA
360 561 0897

AMMERSTONE ASSOCIATION MANAGEMENT

5709 LACEY BLVD SE, Suite #201
LACEY, WA 98503
(360) 455-1131

RECEIVED APR 09 2014

April 7, 2014

City of Lacey
Lacey City Council
ATTN: Council Members
420 College Street SE
Lacey, WA 98503

Dear Council Members:

I am writing in regards to the recent public hearing on creating a Street Tree Ordinance for the City of Lacey. My name is Teresa Hammer and I own Ammerstone Association Management and I am a homeowners association manager. I reviewed printed information about this issue and attended the Lacey Planning Commission meting on April 1st to listen to the Planning Committee's discussion. As you consider "option 2" as recommended by the Planning Commissions you will find it works for now, but will be a problem again and again. This policy needs to have a long term solution. I would like to share my statements from the April 1st meeting with you regarding my concerns on this issue and give you some possible solutions to consider. Thank you, in advance, for your time to review my opinion.

My first concern when reading the briefing/staff report is that language needs to be very clear as to who is responsible. Lumping property owners and homeowners associations in the same sentence will allow blame to shift constantly. As a manager of homeowners association the most important thing to remember is that the property owners inherited all assets from the developer, including the street trees. The homeowners association did not install trees on their own where a property owner of a non-HOA parcel may have. Please review the language on the Street Tree Ordinance, section 12.20.030, section D. The paragraph should be restated to say: "Property owners shall maintain their street trees, the homeowners/condo association shall maintain street trees on their common areas and homeowners in approved HOA plats shall maintain their street trees within the adjacent owners portion of the public right-of-way for all public roadways as follows:..... " This statements provides a clear statement as to who's involved and what areas need to be maintained. Using the word "fronting" will not be clear to owners who have street trees on the side of their property and believe it's someone else's responsibility to maintain. In addition, many of the briefing notes say the HOA is responsible for the street trees but that is an inaccurate statement as most property lines are from the street to rear fence line of lots with an easement along the front or side of the lot for utilities and/or sidewalks. Forcing the responsibility into the HOA's lap will only cause upset when the HOA must point out the City's error in language.

My next concern is what I believe created this issue - to much tree maintenance costs in the budget. The

City of Lacey is known for it's trees and the reason there are so many trees is because the development department required builders/developers to install the street trees decades ago. You need to look at the policy requirements and change the requirements for approving a plat if you don't want to end up with the maintenance costs. I think there are a couple of options to consider:

1. Require less trees in the planter strip (area between the sidewalk and the street) at the development stage.
2. Change the planter strip area so that the sidewalk is next to the street and the street tree sits inside the front/side yard. This action would result with the trees fully on the owners property and less issues with damage to sidewalks.
3. Filing documentation for future maintenance of street trees with the plat would cohesively link City requirements with the Covenants, Conditions, and Restrictions for any homeowners association. If a builder adds more trees than the city required, it would be a document that could be referred to a decade later when tree issues begin to occur, essentially protecting the City.

The City cannot financially sustain maintaining the street trees on all public roadways. However, you may want to consider a phased-in approach on this issue to reduce your maintenance costs over a three to five year time line. Since there has never been a set of regulations on street tree maintenance, everyone has to be educated on this issue. Simply putting a policy in place (like what was done in 2001 and then amended in 2005) did not inform people as to their responsibility. People assume the city takes care of these things. I would suggest the following:

1. Review all the roadways in the City of Lacey. Determine what area the city is to maintain due to the City funded transportation project and all other projects where easement agreements caused the city to install and maintain street trees.
2. Determine which roadway's property owners are responsible for the street trees maintenance and divide the education piece into separate notices.
   A. Property owners (non-HOA owners) who have street trees adjacent to public roadways.
   B. Homeowners/Condo association who have common area street trees adjacent to public roadways
   C. Homeowners in approved HOA plats who have street trees adjacent to public roadways that the Association is not required to maintain.
   <u>NOTE</u>: Some HOA's maintain front yard landscaping and the HOA would be responsible for the street tree maintenance.
3. Plan the "transfer of maintenance" discussion. Start with the easiest properties first.
   A. If an individual owner is already taking care of the street trees, send them a thank you note for doing such a good job. (Who wouldn't love that kind of letter!)
   B. Send notice to the Homeowners/Condo Associations that they are responsible for taking care of street trees adjacent to public roadways and they either get a THANK YOU or a reminder to perform this maintenance. This would be a good place to let them know if they provide landscaping services to front laws, those street trees would also need general maintenance. The HOA would then notify their homeowners.
   C. Send notices to property owners reminding them to perform street tree maintenance for trees adjacent to the public roadway.
4. Educate your staff on the adopted policy. Owners needs to know the city is only responsible for their trees. Make sure the same information is stated in every discussion.

Do not exaggerate the facts with outrageous dollar figures or use scare tactic words like we'll have to cut fire/police staffing. That benefits no one and causes distrust. Property owners/HOA's/Condo owners may need help to take care of the transferred responsibility. The City could perform a one-time trimming to help those who ask - put it in writing - and thereafter the responsibility falls on the property owner. Let owners know about the free forestry review and the pruning and trimming classes available, help them help themselves.

5. Have an enforcement policy in place for those who will need a push for compliance. Many will accept the responsibility, but the City should be prepared for those who will refuse to take care of the street trees and have a plan of action ready to go in those cases.

I believe street trees are needed to provide the beautiful canopy Lacey is known for. However, I think the City should reconsider their replacement requirement. Generally there are three, five, seven trees required on certain sized lots. If the corner lot is 50' by 100', does there need to be three street trees along the 50 foot side and seven along the 100 foot. Do we need street trees every fifteen feet or so? If the maintenance is the property owners responsibility shouldn't the owner have a say about how many they have to take care of on their own property. Recognizing that trees grow and allowing owners to take out overgrown street trees that no longer fit in the right-of-way without replacement is not a negative to the "city of trees" and would cause less sidewalk/asphalt repairs and street drain issues. In addition, you may want to ensure your city forester understands what you're trying to accomplish with this task. They may want to keep trees when it's in some property owners "better" interest to remove them. Make sure owners are clear that the street trees cannot be eliminated, but can be reduced if requested.

I hope I have given you some "food for thought" as you consider option 2 as recommended by the Planning Commissions. Asking everyone to maintain their street trees is a big task and shifting the financial burden to the HOA/condo or an unbeknownst property owner is going to create a major issue unless the education piece is well handled. It will not be an easy task to educate everyone on this new policy, but it can be done. As a professional association manger, we take care of many properties and can come alongside the city and mirror the discussion to help you. I would certainly encourage the conversation to begin with the professionally managed properties first and then tackle the more difficult areas thereafter. Spring is here and it's a good time to begin the discussion.

If you have question, please feel free to contact me. I would be happy to present additional information to the council to help fully understand how this decision will impact property owners in homeowners associations.

Sincerely.

T Hammer

Teresa Hammer
Ammerstone Association Management
(360) 455-1131
Teresa@Ammerstone.com.

cc: Lacey Planning Commission
ATTN: Ryan Andrews - Acting Planning Director
ATTN: Rick Walk - Community Development Director

STAFF REPORT
March 24, 2014

SUBJECT: **Street Tree Ordinance Public Hearing—Proposed LMC 12.20**

RECOMMENDATION: Hold a public hearing and make a formal recommendation to the city council on the proposed street tree regulations—LMC 12.20.

TO: Lacey Planning Commission

STAFF CONTACT: Rick Walk, Director of Community Development RW
Ryan Andrews, Associate Planner RA

ORIGINATED BY: Initiated by Community Development and Public Works staff and identified in the 2013 Urban Forest Management Plan.

ATTACHMENTS:
1. Draft Street Tree Regulations, LMC 12.20
2. Issue Paper

PRIOR COUNCIL/ COMMISSION/ COMMITTEE REVIEW: March 18, 2014 Planning Commission Briefing
December 17, 2013 Planning Commission Briefing
November 5, 2013 Planning Commission Briefing

BACKGROUND:
The City of Lacey has never had a consolidated set of regulations pertaining to street trees and their maintenance. In the past, regulations have been split between the City's Development Guidelines and Public Works Standards and the tree protection regulations contained in Lacey Municipal Code 14.32. This has caused confusion in the application of regulations and enforcement. This situation was recently memorialized in the 2013 update to the Urban Forest Management Plan (UFMP) adopted this past July which states:

"…there have been challenges with maintenance responsibilities for street trees between the City and adjacent property owners. The City's policy has been to maintain street trees on City arterials, commercial areas, and City transportation projects and adjacent property owners or owners associations maintain the remainder. However, this has not been evenly applied across the board and there is a large amount of confusion between adjacent property owners and the City as to who has the maintenance responsibilities. The street tree inventory completed in 2012 will address some of the issues as it will provide a map of all City-maintained trees in Lacey and will therefore provide better information delivery to the public. The City currently lacks an ordinance related to street tree maintenance and may

benefit from developing one in the future. Such an ordinance would provide additional clarity and consistency when it comes to maintenance responsibilities."

To further address the lack of City regulations pertaining to street trees and their maintenance, goals and policies within the UFMP supports development of a street tree program and regulations as an essential part of Lacey's Urban Forestry Plan.

To address the lack of regulations and the confusion regarding maintenance issues, City staff members including both the Community Development and Public Works Departments have collaborated to develop the draft street tree regulations. The key elements of the regulations include:

- Identifying the City's Public Works Department as having the authority to regulate street trees including issuing permits for tree removal or pruning of more than 30% of the canopy of a tree.
- Establishing maintenance standards including requiring trees in the right-of-way to be those identified in the Development Guidelines & Public Works Standards, prohibiting tree topping, and clarifying property owner responsibilities along and fronting City rights-of-way.
- Setting standards for trees on private property adjacent to the right-of-way that may affect public safety or tree health within the right-of-way.
- Establishing procedures related to nuisances and enforcement.

Since these regulations will be administered by the Public Works Department, they will be contained in Chapter 12—Streets and Sidewalks of the municipal code and not in LMC 14.32 which contain tree regulations administered by Community Development.

At the Planning Commission's November 5th meeting, staff provided a briefing on the proposed street tree ordinance. At the briefing, the Planning Commission raised concerns related to equity between the City's past maintenance responsibilities and perceived benefits to certain residents where the City maintains trees versus those developments where all trees are privately maintained. In response, staff prepared an issue paper (see attached) that provides additional background related to past and existing codes and policies, current and future funding sources for right-of-way maintenance, maintenance challenges, and the recently completed street tree inventory.

At the December 5th meeting, the Planning Commission continued the discussion and reiterated their concerns related to equity, the City's legal authority to require property owners adjacent to the right-of-way to maintain trees and landscaping in those areas, and whether requiring maintenance by adjacent property owners is an undue tax.

To assist the Planning Commission in moving the issue forward, staff prepared three alternatives for the regulations which were reviewed at the March 18th meeting: the City maintains all trees it currently maintains as well as any added as part of a transportation project (staff recommended proposal); the City maintains all trees on arterials and collectors; or establishing a dedicated fund by raising taxes for wholesale maintenance of trees throughout the City.

<u>Option 1: Staff Proposal</u>
The current staff-recommended proposal is reflected in the current draft of the street tree regulations which essentially maintains the status quo related to street tree maintenance.

This means that the city will maintain all trees that are currently be maintained as well as any tree that is installed as part of a city transportation project. Currently, the City maintains a total of 2,973 trees at a cost of approximately $65,000 annually. Most trees that the City maintains were installed as part of previous transportation-related improvement project.

The Planning Commission has previously raised concerns about equity related to this option. The crux of the concern is the shift of maintenance and replacement of street trees located on arterials and collectors onto adjacent property owners. The issues associated with this option include:

- Burden to homeowners and HOA's to administer and collect for maintenance of trees.
- Homeowners and HOA's usually are not knowledgeable about proper pruning techniques, additional traffic control needed along busy streets, or the need to call for utility locates.
- Lack of homeowner/HOA knowledge about city policies.
- Lack of resources available if a homeowner is elderly or disabled.

The benefits of this proposal include:

- Keeps the status quo.
- Minimizes cost to the city which frees up money for additional programs including pavement management and general government services.

<u>Option 2: City Maintenance of all Arterials and Collectors</u>

An option to be considered would be to recommend that the city maintains all arterials and collectors. Currently, most of the trees the city maintains are on arterials and collectors. However, there are some key corridors where the city currently does not provide maintenance including Yelm Highway, Rainier Road, Marvin Road, Hawks Prairie Road and Willamette Drive. According to estimates prepared by the Public Works Department, the additional cost to maintain these 2,051 trees would be approximately $150,000 per year for staff time and additional upfront cost for a bucket truck/chipper combination.

The key issues related to this proposal are related to additional cost by the city. Should this be the preferred recommendation, the additional $150,000 per year would take budgeted funds from other programs to do the work—specifically, the concern is that it would further deplete the funds currently used for pavement management and other general government services. Another alternative could be that, instead of the annual maintenance that all trees receive in the city now that the maintenance schedule goes to every two or three years. Reduced annual maintenance would help reduce the budget impact associated with maintaining the additional trees. The issues associated with this option include:

- Higher cost for the city that may take budget funds from other services or programs.
- Additional notification and outreach would be needed to inform the public in the change of policy.

There are several benefits of this proposal including:

- Regular maintenance of trees along city corridors and gateways that provide an overall aesthetic benefit to the city.

- Professional, qualified crews working within the right-of-way that will prevent issues associated with residents doing work in these high traffic areas.

Option 3: City Establishes a Dedicated Fund to Maintain All Trees
The final option would be for the City to establish a dedicated fund to maintain all trees in the city. This could be done by raising taxes or other concept whereby residents are taxed for the benefit of the city maintaining all trees.

At this point, a ballpark estimate for the total number of trees in the city along all streets would be in the neighborhood of 20,000 to 30,000 trees. At our current budget rate, this means that the total cost of maintaining all trees would be approximately $437,269 to $655,903 per year not including any up-front costs such as equipment, etc. There are currently 16,949 households in the City of Lacey. That means that each household would be responsible for paying approximately $26 to $39 per year for street tree maintenance. These numbers are just a guide and could shift based on the exact number of trees in the city and the amount of annual maintenance required. Additionally, not every property in Lacey has street trees—meaning that some residents would be paying for a service that they would not directly benefit from. The issues associated with this option include:

- May be difficult to enact a tax based on voter preferences.
- Would potentially be a hardship for those who are on a limited budget.
- This type of program would require additional operations staffing and equipment as well as requiring additional staff time to administer.

There are benefits associated with this program which would be very similar to those associated with the previous option, including:

- Regular maintenance of trees along city corridors, gateways, and within neighborhoods that provide an overall aesthetic benefit to the city, not only within commercial areas and corridors, but also within neighborhoods.
- Professional, qualified crews working within the right-of-way that will prevent issues associated with residents doing work in high traffic areas and within neighborhoods.
- Potential for increased property values because of improvement to street frontages and the public realm within neighborhoods.

RECOMMENDATION:
The Planning Commission is requested to take public comment and testimony in a public hearing on LMC 12.20—proposed street tree regulations, analyze the testimony, and make a formal recommendation on the regulations to the City Council.

Staff is recommending that the current proposed draft be recommended to the City Council as it minimizes cost to the city which frees up money for additional general government programs and services, memorializes current city policy for what trees are publicly maintained and would thereby require no additional notice to business owners or residents, and would not burden residents with additional cost beyond what they are currently funding.

STAFF REPORT
March 12, 2014

SUBJECT: **Draft Street Tree Ordinance—Proposed LMC 12.20**

RECOMMENDATION: Staff will present the current draft street tree regulations and present three options for the maintenance and replacement of street trees on arterials and collectors. At the conclusion of the briefing, the Planning Commission is requested to develop a preferred alternative draft of the regulations and schedule a public hearing for the next regular meeting of April 1, 2014.

TO: Lacey Planning Commission

STAFF CONTACT: Rick Walk, Director of Community Development
Ryan Andrews, Associate Planner RA

ORIGINATED BY: Initiated by Community Development and Public Works staff and identified in the 2013 Urban Forest Management Plan.

ATTACHMENTS:
1. Draft Street Tree Regulations, LMC 12.20
2. Issue Paper
3. E-mail from David Schneider, City Attorney, dated January 31, 2014

PRIOR COUNCIL/ COMMISSION/ COMMITTEE REVIEW: December 17, 2013 Planning Commission Briefing
November 5, 2013 Planning Commission Briefing

BACKGROUND:
At the Planning Commission's November 5th meeting, staff provided a briefing on the proposed street tree ordinance. The ordinance sets to regulate maintenance of trees on public rights-of-way as well as private trees that effect the right-of-way (i.e. trees that project into the right-of-way, are a hazard and are in danger of falling into the right-of-way, etc.).

At the briefing, the Planning Commission raised concerns related to equity between the City's past maintenance responsibilities and perceived benefits to certain residents where the City maintains trees versus those developments where all trees are privately maintained. In response, staff prepared an issue paper (see attached) that provides additional background related to past and existing codes and policies, current and future funding sources for right-

of-way maintenance, maintenance challenges, and the recently completed street tree inventory.

At the December 5th meeting, the Planning Commission continued the discussion and reiterated their concerns related to equity, the City's legal authority to require property owners adjacent to the right-of-way to maintain trees and landscaping in those areas, and whether requiring maintenance by adjacent property owners is an undue tax. In response to the concerns about right-of-way maintenance responsibilities for adjacent property owners, the City Attorney has responded that the City does have the authority. Additionally, he determined that under the City's police powers, the expenditure of time and effort necessary for the maintenance is incidental to the enjoyment of the property and would therefore not be an undue tax. The City Attorney's e-mail is attached for your review.

To assist the Planning Commission in moving the issue forward, staff has prepared three alternatives for the regulations: as proposed with the City maintaining all trees it currently maintains as well as any added as part of a transportation project; the City maintains all trees on arterials and collectors; or establishing a dedicated fund by raising taxes for wholesale maintenance of trees throughout the City.

Option 1: Staff Proposal

The current staff proposal is reflected in the current draft of the street tree regulations which essentially maintains the status quo related to street tree maintenance. This means that the city will maintain all trees that are currently be maintained as well as any tree that is installed as part of a city transportation project. Currently, the City maintains a total of 2,973 trees at a cost of approximately $65,000 annually. Most trees that the City maintains were installed as part of previous transportation-related improvement project.

The Planning Commission has previously raised concerns about equity related to this option. The crux of the concern is the shift of maintenance and replacement of street trees located on arterials and collectors onto adjacent property owners. The issues associated with this option include:

- Burden to homeowners and HOA's to administer and collect for maintenance of trees.
- Homeowners and HOA's usually are not knowledgeable about proper pruning techniques, additional traffic control needed along busy streets, or the need to call for utility locates.
- Lack of homeowner/HOA knowledge about city policies.
- Lack of resources available if a homeowner is elderly or disabled.

The benefits of this proposal include:

- Keeps the status quo.
- Minimizes cost to the city which frees up money for additional programs including pavement management and general government services.

Option 2: City Maintenance of all Arterials and Collectors

An option to be considered would be to recommend that the city maintains all arterials and collectors. Currently, most of the trees the city maintains are on arterials and collectors. However, there are some key corridors where the city currently does not provide maintenance including Yelm Highway, Rainier Road, Marvin Road, Hawks Prairie Road and Willamette Drive. According to estimates prepared by the Public Works Department, the

additional cost to maintain these 2,051 trees would be approximately $150,000 per year for staff time and additional upfront cost for a bucket truck/chipper combination.

The key issues related to this proposal are related to additional cost by the city. Should this be the preferred recommendation, the additional $150,000 per year would take budgeted funds from other programs to do the work—specifically, the concern is that it would further deplete the funds currently used for pavement management and other general government services. Another alternative could be that, instead of the annual maintenance that all trees receive in the city now that the maintenance schedule goes to every two or three years. Reduced annual maintenance would help reduce the budget impact associated with maintaining the additional trees. The issues associated with this option include:

- Higher cost for the city that may take budget funds from other services or programs.
- Additional notification and outreach would be needed to inform the public in the change of policy.

There are several benefits of this proposal including:

- Regular maintenance of trees along city corridors and gateways that provide an overall aesthetic benefit to the city.
- Professional, qualified crews working within the right-of-way that will prevent issues associated with residents doing work in these high traffic areas.

<u>Option 3: City Establishes a Dedicated Fund to Maintain All Trees</u>
The final option would be for the City to establish a dedicated fund to maintain all trees in the city. This could be done by raising taxes or other concept whereby residents are taxed for the benefit of the city maintaining all trees.

At this point, a ballpark estimate for the total number of trees in the city along all streets would be in the neighborhood of 20,000 to 30,000 trees. At our current budget rate, this means that the total cost of maintaining all trees would be approximately $437,269 to $655,903 per year not including any up-front costs such as equipment, etc. There are currently 16,949 households in the City of Lacey. That means that each household would be responsible for paying approximately $26 to $39 per year for street tree maintenance. These numbers are just a guide and could shift based on the exact number of trees in the city and the amount of annual maintenance required. Additionally, not every property in Lacey has street trees—meaning that some residents would be paying for a service that they would not directly benefit from. The issues associated with this option include:

- May be difficult to enact a tax based on voter preferences.
- Would potentially be a hardship for those who are on a limited budget.
- This type of program would require additional operations staffing and equipment as well as requiring additional staff time to administer.

There are benefits associated with this program which would be very similar to those associated with the previous option, including:

- Regular maintenance of trees along city corridors, gateways, and within neighborhoods that provide an overall aesthetic benefit to the city not only within commercial areas and corridors but also within neighborhoods.

- Professional, qualified crews working within the right-of-way that will prevent issues associated with residents doing work in high traffic areas and within neighborhoods.
- Potential for increased property values because of improvement to street frontages in neighborhoods.

RECOMMENDATION:
Staff will present the current draft street tree regulations and present three options for the maintenance and replacement of street trees on arterials and collectors. At the conclusion of the briefing, the Planning Commission is requested to develop a preferred alternative draft of the regulations and schedule a public hearing for the next regular meeting of April 1, 2014.

Staff's recommendation is to move forward with the current proposed draft as it minimizes cost to the city which frees up money for additional general government programs and services, memorializes current city policy for what trees are publicly maintained and would thereby require no additional notice to business owners or residents, and would not burden residents with additional cost beyond what they are currently funding.

STAFF REPORT
December 11, 2013

SUBJECT: **Draft Street Tree Ordinance—Proposed LMC 12.20**

RECOMMENDATION: Staff will present the revised draft street tree regulations and the issue paper developed to address concerns raised at the previous briefing. At the conclusion of the briefing, the Planning Commission is requested to schedule a public hearing on the proposed regulations for the next regular meeting of January 7, 2014.

TO: Lacey Planning Commission

STAFF CONTACT: Rick Walk, Director of Community Development RW
Ryan Andrews, Associate Planner RA

ORIGINATED BY: Initiated by Community Development and Public Works staff and identified in the 2013 Urban Forest Management Plan.

ATTACHMENTS:
1. Issue Paper
2. Revised Draft Street Tree Regulations, LMC 12.20
3. DG&PWS Street Tree Maintenance Policy History

PRIOR COUNCIL/ COMMISSION/ COMMITTEE REVIEW: Urban Forestry Plan amendments in 2013 include policy direction to develop a street tree ordinance. Development of a street tree ordinance is also included in the 2013-2014 work program.

BACKGROUND:
At the Planning Commission's November 5th meeting, staff provided a briefing on the proposed street tree ordinance. The ordinance sets to regulate maintenance of trees on public rights-of-way as well as private trees that effect the right-of-way (i.e. trees that project into the right-of-way, are a hazard and are in danger of falling into the right-of-way, etc.).

At the briefing, the Planning Commission raised concerns related to equity between the City's past maintenance responsibilities and perceived benefits to certain residents where the City maintains trees versus those developments where all trees are privately maintained. Staff has prepared an issue paper that provides additional background related to past and existing codes and policies, current and future funding sources for right-of-way maintenance, maintenance challenges, and the recently completed street tree inventory.

Additionally, the Planning Commission provided some recommendations for minor changes to the draft ordinance which are included for your review. These changes included clarifications related to maintenance responsibilities, permit requirements under LMC 14.32, and added appeals language for appeals of nuisance procedures.

RECOMMENDATION:
Staff will present the second draft of the street tree regulations as well as present an issue paper related to concerns raised at the previous briefing. At the conclusion of the briefing, the Planning Commission is requested to schedule a public hearing to accept public testimony for the next regular meeting of January 7, 2014.

STAFF REPORT
October 29, 2013

SUBJECT: **Draft Street Tree Ordinance—Proposed LMC 12.20**

RECOMMENDATION: Staff will present the draft street tree regulations and address any comments or questions. At the conclusion of the briefing, the Planning Commission is requested to schedule a public hearing on the proposed regulations for the next regular meeting of November 19, 2013.

TO: Lacey Planning Commission

STAFF CONTACT: Rick Walk, Director of Community Development
Ryan Andrews, Associate Planner RA

ORIGINATED BY: Initiated by Community Development and Public Works staff and identified in the 2013 Urban Forest Management Plan.

ATTACHMENTS: 1. Draft Street Tree Regulations, LMC 12.20

PRIOR COUNCIL/ COMMISSION/ COMMITTEE REVIEW: Urban Forestry Plan amendments in 2013 include policy direction to develop a street tree ordinance. Development of a street tree ordinance is also included in the 2013-2014 work program.

BACKGROUND:
The City of Lacey has never had a consolidated set of regulations pertaining to street trees and their maintenance. In the past, regulations have been split between the City's Development Guidelines and Public Works Standards and the tree protection regulations contained in Lacey Municipal Code 14.32. This has caused confusion in the application of regulations and enforcement. This situation was recently memorialized in the 2013 update to the Urban Forest Management Plan (UFMP) adopted this past July which states:

> "…there have been challenges with maintenance responsibilities for street trees between the City and adjacent property owners. The City's policy has been to maintain street trees on City arterials, commercial areas, and City transportation projects and adjacent property owners or owners associations maintain the remainder. However, this has not been evenly applied across the board and there is a large amount of confusion between adjacent property owners and the City as to who has the maintenance responsibilities. The street tree inventory completed in 2012 will address some of the issues as it will provide a map of all City-maintained trees in Lacey and

will therefore provide better information delivery to the public. The City currently lacks an ordinance related to street tree maintenance and may benefit from developing one in the future. Such an ordinance would provide additional clarity and consistency when it comes to maintenance responsibilities."

To further address the lack of City regulations pertaining to street trees and their maintenance, goals and policies within the UFMP supports development of a street tree program and regulations as an essential part of Lacey's Urban Forestry Plan.

To address the lack of regulations and the confusion regarding maintenance issues, City staff members including both the Community Development and Public Works Departments have collaborated to develop the attached draft street tree regulations for review. The key elements of the regulations include:

- Identifying the City's Public Works Department as having the authority to regulate street trees including issuing permits for tree removal or pruning of more than 30% of the canopy of a tree.
- Establishing maintenance standards including requiring trees in the right-of-way to be those identified in the Development Guidelines & Public Works Standards, prohibiting tree topping, and clarifying property owner responsibilities along and fronting City rights-of-way.
- Setting standards for trees on private property adjacent to the right-of-way that may affect public safety or tree health within the right-of-way.
- Establishing procedures related to nuisances and enforcement.

Since these regulations will be administered by the Public Works Department, they will be contained in Chapter 12—Streets and Sidewalks of the municipal code and not in LMC 14.32 which contain tree regulations administered by Community Development.

To assist in discussion purposes, staff has developed the following list of pros and cons related to the ordinance as proposed. Please keep these in mind when reviewing the regulations.

Pros:

- Provides better consistency in administering tree standards in the right-of-way.
- Clearly indicates when fronting property owners are responsible for maintenance.
- City would have better and clearer authority to address hazardous trees adjacent to the right-of-way.
- Establishes nuisance and enforcement procedures.

Cons:

- Puts more of the burden on fronting property owners and/or associations who may be responsible for additional maintenance where they may be currently responsible for little or none.
- Would require some notification procedure (potential methods could include individual mailing, utility bill insert, Lacey Life, press releases, website notification, Twitter, etc.) to let residents and businesses know of the change in policy.

RECOMMENDATION:

Staff will present the draft street tree regulations and address any comments or questions. At the conclusion of the briefing, the Planning Commission is requested to schedule a public hearing to accept public testimony for the next regular meeting of November 19, 2013.

Street Tree Ordinance
Additional Background and Analysis

At the Planning Commission's November 5th meeting, staff provided a briefing on the proposed street tree ordinance. The ordinance sets to regulate maintenance of trees on public rights-of-way as well as private trees that effect the right-of-way (i.e. trees that project into the right-of-way, are a hazard and are in danger of falling into the right-of-way, etc.). At the briefing, the Planning Commission raised concerns related to equity between the City's past maintenance responsibilities and perceived benefits to certain residents where the City maintains trees versus those developments where all trees are privately maintained. The following analysis provides additional background related to past and existing codes and policies, current and future funding sources for right-of-way maintenance, maintenance challenges, and the recently completed street tree inventory.

Summary of Past and Existing Codes and Policies

In 2001, the DG&PWS (section 4G.100.D) stated that the City will be responsible for pruning all street trees located in the right-of-way and the adjacent owner or homeowner's association was required to mow and week the planter strip. This policy continued until 2005 when the DG&PWS was amended to read that the City will be responsible for all street trees located in the right-of-way along arterials and collectors with the owners or homeowner's associations responsible for mowing, weeding, and tree maintenance. Additionally, owners or homeowner's associations were responsible for tree and planter strip maintenance within neighborhoods. The 2009 edition of the DG&PWS reflects this current policy. However, our current (unwritten) policy is to also maintain the planter strip (including roundabouts, medians, etc.) associated with improvements constructed by the City as part of City transportation projects.

The current draft of the Street Tree Ordinance attempts to formalize the unwritten policy by stating that the City is/will be responsible for planter strip and street tree maintenance associated with improvements constructed as part of City transportation projects as well as any trees that we are currently maintaining on the effective date of the ordinance.

The Planning Commission questioned the equity of the current proposed Street Tree Ordinance language because tax monies are used to maintain trees for the benefit of private developments that we are already maintaining consistent with old policies and not maintaining others. In effect, the City has grown into this situation with a variety of different policies over the last 12 years. A similar situation is related to stormwater. Older developments within the city are generally not responsible to maintain stormwater infrastructure as older developments were created prior to strict regulations pertaining to the design and maintenance of stormwater facilities. Newer developments are required to privately maintain the ponds, swales, and other facilities as the policies related to stormwater changed over time putting the responsibilities related to these facilities into the hands of residents and owners associations. Additionally, as more streets and neighborhoods are constructed, City resources are not keeping pace with a growing community and the desire to maintain the aesthetic quality that

tree-lined streets provide. As a result, our policies and practice also need to evolve to balance the aesthetic expectation of the community with City resource limitations.

Funding Sources

The City spends approximately $65,000 per year on right-of-way maintenance funded through the General Fund of the City's annual budget. The General Fund is funded primarily through sales tax, property tax, and utility taxes and supports most City operations not funded under a separate utility. The General Fund also funds public safety, public works, parks, planning, etc. There are essentially no other city funding sources other than the general fund available for dedication to street tree maintenance at this time. Other funding sources such as establishing a Transportation Benefit District (TBD) have been discussed in the past; however, this source as been addressed as a tool to bridge the financial gap for maintenance of streets—specifically the pavement management program. This is especially important since the elimination of the $850,000 of annual funding in 2012 for pavement overlay and the continual pressures to fund such a program. According to the City's annual "State of the Streets Report", the overall pavement rating within the city declines even with an annual budget of $1,000,000—it would take a budget of nearly $3,000,000 annually just to keep our overall pavement rating at present levels. If a TBD is enacted, this would fund approximately $400,000 per year of transportation improvements—less than half of what our previous funding levels just for pavement maintenance.

For the next five years, the City expects to have budget deficits which means that we will have to take money from other programs to balance the budget, therefore limiting the amount of any additional funds the City can dedicate to additional right-of-way maintenance. However, through the budgeting process, the City is exploring establishment of a program to assist neighbors in removing and replacing trees. This program will assist homeowners who may not have the resources to otherwise remove dead, dying, or hazardous trees within their neighborhood by utilizing existing city staff and other resources to address these issues.

Maintenance Challenges

Ideally, the City would maintain all trees within the right-of-way. Our staff is trained to deal with urban forestry issues, knows correct pruning techniques, has the equipment needed to do a quality job, and we have International Society of Arboriculture certified arborists on staff. However, resource limitations make this infeasible. This means that, as equitably as possible, our residents, property owners, and business owners are responsible for maintaining these assets. To assist property owners, the City has held workshops in the past as part of our quarterly homeowner's association meetings with our city arborist who presented information related to proper street tree maintenance and care. The City also provides the services of our arborist free of charge to interested neighborhoods to provide hands-on demonstrations related to proper street tree care. The City will need to continue to invest in educational programs to inform our businesses and residents on proper tree care. These educational programs are important, however, inconsistencies between privately maintained trees and the quality maintenance that City staff can provide will be an on-going issue.

Map and Summary of Existing Maintenance

In 2012, the City completed a comprehensive inventory of street trees on all arterials, collectors, and within all commercial areas. This map is not only important for the City to know what our urban forest resources are, but also as a tool to inform residents and business owners about responsibility requirements related to trees. As part of the inventory, the City has identified whether each tree is publicly or privately maintained. This information is available through the City's internal GIS system and is a vital public information tool.

The City maintains trees associated with City transportation projects, certain arterials and collectors associated with past policies established in the Development Guidelines and Public Works Standards, and in certain commercial areas. The proposed regulations propose to continue this practice by maintaining any trees we currently maintain but any additional trees located along streets will be maintained by the adjacent property owners, owner's association, etc. Staff will present a map of the 2012 street tree inventory to the Planning Commission to provide a more graphic illustration of those trees that we currently provide maintenance on versus those that are privately maintained.

Retaining walls located on private property where the public right-of-way line is closer than the height of the wall shall not exceed 4-feet in height unless the wall is designed by a Washington State Licensed Professional Engineer and the wall meets all the requirements of the adopted Building Code. Walls meeting this criteria must be approved by the Director of Public Works and the Building Official.

Retaining walls over 4-feet in height located on a public right-of-way shall meet or exceed WSDOT design standards and be designed by a Washington State Licensed Professional Engineer.

4G.100 Street Trees

All public streets within the City and the City's UGMA boundary will be planted with trees to create a distinct and pleasant character for those roadways. The street trees on the following table shall be required in or along the public right-of-way. Contact the City for specific street and accent trees in the core area.

See Chapter 4B.125, Landscape/Planter Areas, for specific site preparation requirements.

A. Planting theme

1. Ratio: 3 street trees to 1 accent tree.

2. Species: See following table.

A. Planting size: Trees, 2 to 3-inch caliper, measured 6-inches above the base. Ground cover (i.e., kinnikinnick), 4-inch pot spaced 18 to 20-inches on center or 1 gallon pots at 20-inches on center. Low growth shrubs (i.e., Oregon grape), 1 gallon pots at 3-feet on center. Shrubs (i.e., rhododendron), 18 to 24-inches in height at 5-feet on center or 3 gallon pot at 5-feet on center.

B. Location: Trees shall be centered in the median or as shown on the applicable roadway detail. Trees shall be spaced 35-feet on center starting 10 to 15-feet from the property line. Exceptions may be made when there are existing sidewalks. Street trees may then be planted 3 to 5-feet behind the sidewalk. Tree spacing may be adjusted slightly to allow a minimum 10-foot spacing on either side of a driveway.

D. Maintenance: All projects, regardless of type or zoning, required to plant street trees will also be required to maintain the trees in perpetuity, regardless of ownership. Trees shall be maintained per ANSI A300, Standard Practices for Trees, Shrubs and other Woody Plant Maintenance.

The City will be responsible for pruning all street trees located in the right-of-way. The owner/homeowner's association is responsible for mowing and weeding. See Chapter 6.210 for installation and maintenance of irrigation systems. Medians shall be maintained by the City.

E. Exceptions to the planting theme may be made by the Director of Public Works and the Director of Parks and Recreation. Exceptions include but are not limited to; screening industrial areas; planting around historical sites; maintaining natural vegetation that better serves as street landscaping or beautification.

Reference: City of Lacey Urban Beautification Project Plan and Resolution 633.

Retaining walls on private property shall meet the requirements of the adopted Building Code. Retaining walls located on private property shall be set back from any public right-of-way line a distance at least equal to the height of the wall unless otherwise approved by the Director of Public Works.Retaining walls located on private property where the public right-of-way line is closer than the height of the wall shall not exceed 4-feet in height unless the wall is designed by a Washington State Licensed Professional Engineer and the wall meets all the requirements of the adopted Building Code. Walls meeting this criteria must be approved by the Director of Public Works and the Building Official.

Retaining walls over 4-feet in height located on a public right-of-way shall meet or exceed WSDOT design standards and be designed by a Washington State Licensed Professional Engineer.

4G.100 Street Trees

All public streets within the City and the City's UGA boundary will be planted with trees to create a distinct and pleasant character for those roadways. The street trees on the following table shall be required in or along the public right-of-way, including medians. Contact the City for specific street and accent trees in the core area.

See Chapter 4B.125, Landscape/Planter Areas, for specific site preparation requirements.

A. Planting theme

1. Ratio: 3 street trees to 1 accent tree.

2. Species: See following table.

B. Planting size: Trees, 2 to 3-inch caliper, measured 6-inches above the base. Ground cover (i.e., kinnikinnick), 4-inch pot spaced 18 to 20-inches on center or 1 gallon pots at 20-inches on center. Low growth shrubs (i.e., Oregon grape), 1 gallon pots at 3-feet on center. Shrubs (i.e., rhododendron), 18 to 24-inches in height at 5-feet on center or 3 gallon pot at 5-feet on center.

C. Location: Trees shall be as shown on the applicable roadway details. Trees shall be spaced 35-feet on center starting 10 to 15-feet from the property line. Exceptions may be made when there are existing sidewalks. Street trees may then be planted 3 to 5-feet behind the sidewalk. Tree spacing may be adjusted slightly to allow a minimum 10-foot spacing on either side of a driveway.

D. Maintenance: All projects, regardless of type or zoning, required to plant street trees will also be required to maintain the trees in perpetuity,

regardless of ownership. Trees shall be maintained per ANSI A300, Standard Practices for Trees, Shrubs and other Woody Plant Maintenance.

The City will be responsible for pruning all street trees located in the right-of-way along arterials and collectors. The owner/homeowner's association is responsible for mowing, weeding, and tree maintenance within the respective right-of-way and common areas. See Chapter 6.210 for installation and maintenance of irrigation systems. At the time of plat or site plan review approval, the City will determine responsibility for maintenance of medians.

E. Exceptions to the planting theme may be made by the Director of Public Works. Exceptions include but are not limited to; screening industrial areas; planting around historical sites; maintaining natural vegetation that better serves as street landscaping or beautification.

Reference: City of Lacey Urban Beautification Project Plan and Resolution 633.

State Licensed Professional Engineer and the wall meets all the requirements of the adopted Building Code. Walls meeting these criteria must be approved by the Director of Public Works and the Building Official.

Retaining walls over 4 feet in height located on a public right-of-way shall meet or exceed WSDOT design standards and be designed by a Washington State Licensed Professional Engineer.

4G.100 Street Trees

All public streets within the City and the City's UGA boundary will be planted with trees to create a distinct and pleasant character for those roadways. The street trees on the following table shall be required in or along the public right-of-way, including medians. Contact the City for specific street and accent trees on arterial and collector streets. These have been specified in the current version of the Lacey Urban Forest Management Plan.

See Chapter 4B.125, Landscape/Planter Areas, for specific site preparation requirements.

A. Planting theme

1. Street tree plantings shall be in accordance with the Lacey Urban Forest Management Plan.

2. Species: See following table.

B. Planting size: Trees, 2 to 3 inch caliper, measured 6 inches above the base.

C. Location: Trees shall be as shown on the applicable roadway details. Trees shall be spaced 35 to 50 feet on center (as directed by the City of Lacey) starting 10 to 15 feet from the property line. Also, trees shall not be planted within 50 feet of the intersection measured from the curb radius. Exceptions may be made when there are existing sidewalks. Street trees may then be planted 3 to 5 feet behind the sidewalk. Tree spacing may be adjusted slightly to allow a minimum 10 foot spacing on either side of a driveway.

D. Maintenance: All projects, regardless of type or zoning, required to plant street trees will also be required to maintain the trees in perpetuity, regardless of ownership. Trees shall be maintained per the current version of ANSI A300, Standard Practices for Trees, Shrubs and other Woody Plant Maintenance.

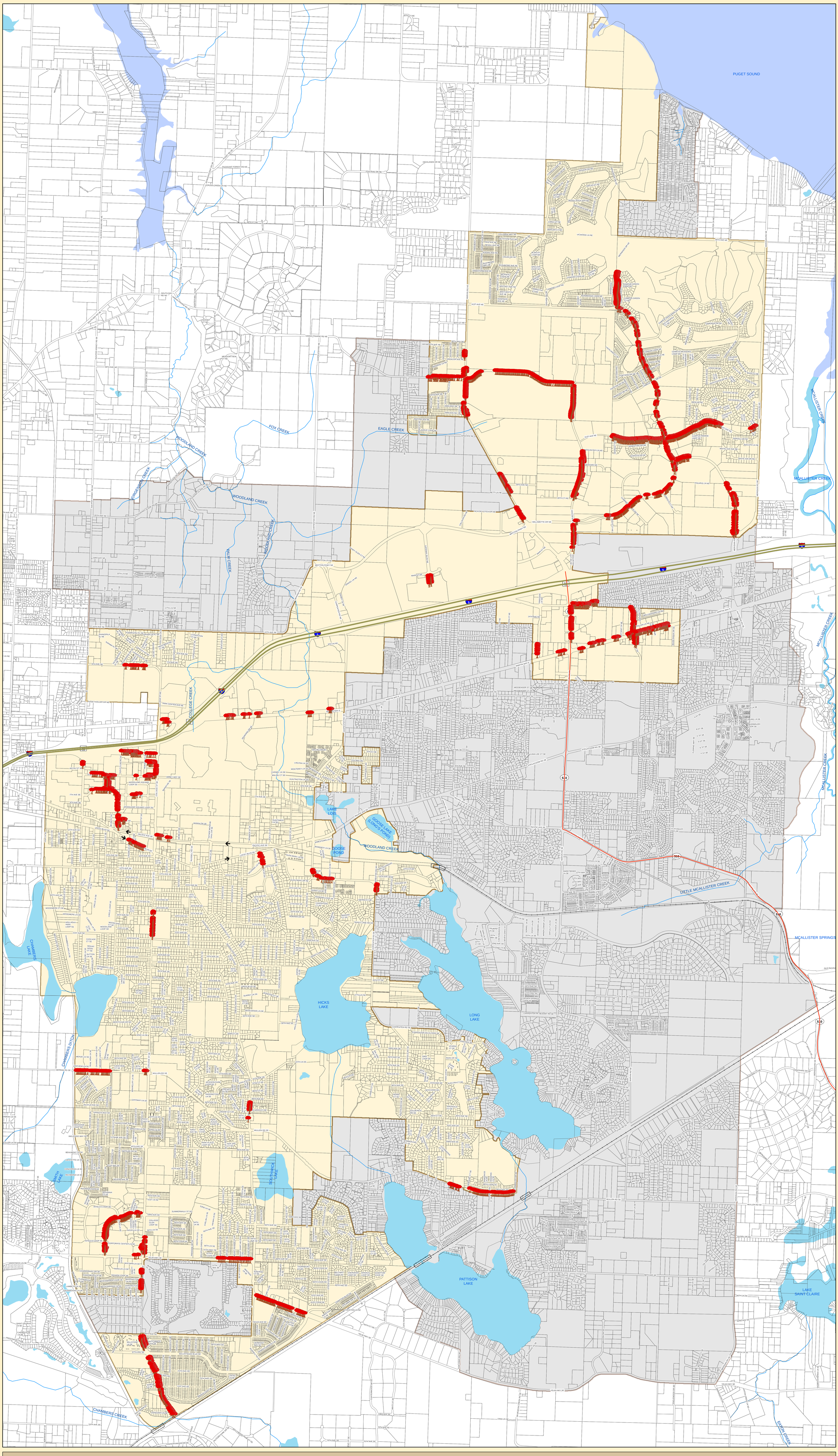
The City will be responsible for pruning all street trees located in the right-of-way along arterials and collectors. The owner/homeowner's association is responsible for mowing, weeding, watering, replacement (replaced due to death, damage or disease after approval by a City representative)_and any other tree maintenance within the respective right-of-way and common areas. See Chapter 6.210 for installation and maintenance of irrigation systems. At the time of plat or site plan review approval, the City will determine responsibility for maintenance of medians.

E. Exceptions to the planting theme may be made by the Director of Public Works. Exceptions include but are not limited to; screening industrial areas; planting around historical sites; maintaining natural vegetation that better serves as street landscaping or beautification.

Reference: City of Lacey Urban Beautification Project Plan and Resolution 633.

GENERAL TREE LIST FOR LACEY

COMMON NAME	BOTANICAL NAME	CULTIVAR	MATURE HEIGHT	CROWN SPREAD	SPACING
Large >50' Tall					40-50'
Northern Red Oak	*Quercus rubra*		70'	45'	
Tuliptree	*Liriodendron tulipfera*		70'	35'	
Autumn Purple Ash	*Fraxinus americana*	Autumn Purple	50'	35'	
Sugar Maple	*Acer saccharum*	Commemoration/ Bonfire	60'	35'	
European Beech	*Fagus sylvatica*		50'	35'	
Scarlet Oak	*Quercus coccinea*		60'	40'	
Medium-Narrow Crowns 40-50' Tall					25-35'
Columnar Tuliptree	*Liriodendron tulipfera*	Fastigiatum	50'	15'	
Armstrong Red Maple	*Acer rubrum*	Armstrong	45'	15'	
Bowhall Red Maple	*Acer rubrum*	Bowhall	40'	15'	
Parkway Maple	*Acer platanoides*	Columnar-broad	40'	25'	
Skyrocket Oak	*Quercus robur*	Fastigiata	45'	15'	
Medium – Wider Crowns 40-50' Tall					35-40'
Littleleaf Linden	*Tilia cordata*	Greenspire	40'	30'	
Summit Ash	*Fraxinus pennsylvanica*	Summit	45'	25'	
Patmore Ash	*Fraxinus pennsylvanica*	Patmore	45'	35'	
Norway Maple	*Acer platanoides*	Emerald Queen	45'	40'	
Red Sunset Maple	*Acer rubrum*	Red Sunset	45'	35'	



Arterial and Collector Street Trees
Not City Maintained

Revised: December 31, 2013

0 0.25 0.5 Miles

N W E S

- Arterial and Collector Private Trees
- City Limits
- UGA
- Parcels

LACEY CITY COUNCIL WORKSESSION
January 15, 2015

SUBJECT: **Sign Ordinance Update**

RECOMMENDATION: **Hear a briefing from staff and consultant on the proposed revisions to the sign ordinance. The Council will consider adoption of the updated sign ordinance at the regular meeting scheduled for February 12.**

STAFF CONTACT: Scott Spence, City Manager
Rick Walk, Community Development Director
Ryan Andrews, Planning Manager

ORIGINATED BY: Community Development Department

ATTACHMENTS:
1. Sign Ordinance-Planning Commission Recommendation Draft
2. Planning Commission Record

FISCAL NOTE: None.

PRIOR REVIEW: The City Council has had status updates throughout the sign ordinance update process the most recent being the November 3, 2014 Land Use Committee briefing.

BACKGROUND:

Based on changed economic conditions, new technologies and sub-area planning over the past fifteen years, the City Council identified the update of the sign ordinance as a priority to reflect and balance the current business and aesthetic needs of the community.

The purpose of the sign code update is to create standards that will enhance business identification, community character and aesthetics of the City especially along major transportation corridors and commercial shopping areas. Additionally, the goals of the update include:

- Improvement of storefront and business identity and recognition.

- Enhancing signage opportunities for businesses separated from fronting streets by parking lots or other buildings.
- Development of standards that consider commercial scale and target audiences from pedestrian environments to collector, arterial and freeway frontages.
- Compatibility with various zoning districts, including those that emphasize pedestrian-scaled development through form-base and mixed use districts.

The City used a community-based approach in the review and amendment to the sign ordinance by enlisting the assistance of a signage committee with representation from businesses, community groups, citizens and the City. The sign committee met a total of seven times (including three public meetings/workshops). The draft regulations are their recommended version and came as a result of these meetings.

Three public meetings/workshops were held. The purpose of each workshop was to hear from the consultant team led by Makers Architecture and Urban Design on development of the draft, preliminary recommendations, and to solicit directly from attendees their concerns, ideas and suggestions related to signage and how best to address the issues. At each meeting, the members of the appointed signage committee facilitated discussions with members of the business community and public on the various signage issues and proposed solutions.

The following items outline the major issues that the updated regulations are addressing as well as the proposed solutions to address the specific issue:

<u>Issue:</u> Allow for greater business visibility for businesses along major corridors, specifically focusing on individual strip center businesses that are set back from the street.

<u>Proposed solutions:</u>

- Allow more monument signs. Recommendations include allowing more monument signs for multi-tenant centers based on the amount of right-of-way frontage and the speed limit of the adjacent street, provided that a minimum separation distance is maintained.
- Allow for larger monument signs. Based on the amount of right-of-way frontage, monument signs are generally allowed to be larger than current code. Also, bonus height can be obtained by implementing light copy on dark backgrounds and for including a center name on the sign.
- Allow perpendicular signs. Current sign code only allows for flush-mounted wall signs. Allowing perpendicular signs and establishing requirements for these types of signs will enhance signage opportunities for buildings set back from the street and will provide architectural interest to the building.
- Emphasize the opportunity for internal wayfinding signs. Internal wayfinding signs are typically internal to a multiple building complex and help users find individual businesses within a complex. At the public workshops, many business owners did not know that these signs were allowed under the current regulations so the proposed regulations seek to enhance and increase the size of these signs so that more business and property owners would take advantage of the provisions.

Issue: In allowing more signage opportunities, ensure that visual clutter is minimized along streets.

Proposed solutions:

- Use the "Street Graphics" approach for free-standing signs that reduces clutter and improves legibility by limiting the total amount of information on the sign. "Street Graphics" is a book of standards adopted by several jurisdictions around the country. The standards are rooted in sign science and focus on the amount of information on a sign that is digestible by the traveling public based on the speed of the adjacent street.
- Require that street addresses or block numbers be shown on freestanding signs to aid motorists using GPS or other means in finding street addresses for businesses.

Issue: Integrate sign design guidelines to ensure architectural form and character is reflected in sign design. Throughout the public workshops, many business owners referred to our current signage regulations as sterile and lack any incentive for creativity.

Proposed solutions:

- The proposed regulations have integrated architectural form & character into sign design. Also included are design guidelines for free-standing and building-mounted signs to help integrate signs with the architectural form/character of the building and site.
- Use of "departures", which would be used in place of a formal variance, for sign designs that vary from a portion of the standards but exceed the desired design intent to foster creativity and uniqueness in signage design. Departures would be considered for many sign types including freestanding and freeway oriented signs.

Issue: Address emerging signage techniques and technology related to digital/electronic messaging signage.

Proposed solutions:

- Allow for digital signage to be integrated into freestanding signs (including multi-tenant centers, standalone businesses, and freeway oriented signs) provided conditions are included to limit clutter and negative visual impacts. This includes proposed standards for a 10-second dwell time (the time a digital sign is required to have a static display before changing to another message), prohibition on animation and/or transitions, and requirements related to illumination.
- Allow for digital directories to provide greater sign display opportunities for individual businesses. The proposed regulations include an allowance for multi-tenant signs to be 1/3 digital directory, 1/3 digital changing display (denoting sales, products sold on site, etc.) and 1/3 standard static sign. For individual businesses, the proposed regulations would allow up to 50% of a free-standing sign to be a digital display.

Issue: Provide greater flexibility related to the use of temporary signage without contributing to roadside clutter.

Proposed solutions:

- Provide greater flexibility for the use of sandwich board and feather signs. Included in the proposed regulations are provisions for a multi-business complex to place sandwich board and/or feather signs associated with a City-approved signage program in approved locations.
- Allow for temporary sales events by private businesses. Current regulations do not all for businesses to have any additional temporary signage advertising opportunities outside of grand opening displays. The draft regulations have provisions for private sales events where, with approval of the city, a business can have temporary sales displays on no more than four occasions not to exceed a total of 30 days combined.

The Planning Commission held a public hearing on November 18. One person spoke at the hearing and two written comments were received. One of the written comments received was from the Wig Property Group who controls the Gateway Town Center property. The Planning Commission requested that staff review their comments and provide an analysis of the issues that were raised. The written comments and staff analysis is attached to the staff report. As a result of the comments, some modifications to the proposed regulations were made. These are noted in the analysis. At their December 2 meeting, the Planning Commission voted unanimously to recommend the draft of the updated signage regulations to the City Council for adoption.

ADVANTAGES:

1. Updated standards will enhance business identification, community character and aesthetics of the City, especially along major transportation corridors and commercial shopping areas.

2. Signage opportunities would be enhanced for businesses separated from fronting streets by parking lots or other buildings.

3. In allowing more signage opportunities, visual clutter is minimized along streets using the “street graphics” approach.

DISADVANTAGES:

1. None.

Chapter 16.75
SIGN REGULATIONS

PLANNING COMMISSION RECOMMENDATION DRAFT 1/15/15

Sections:

16.75.010 Intent

16.75.020 Definitions and abbreviations

16.75.030 Applicability

16.75.040 Administration

16.75.050 Prohibited signs

16.75.060 General sign provisions

16.75.070 Permitted signs

16.75.080 Sign type standards

16.75.090 Residential district sign standards

16.75.100 Temporary/portable signs

16.75.110 Legal non-conforming signs

16.75.120 Enforcement and sign removal

16.75.130 Severability

16.75.010 Intent.

The intent of this chapter is to promote public health, safety, and welfare through a comprehensive system of reasonable, effective, consistent, content-neutral, and non-discriminatory sign standards and requirements, including the following purposes:

A. Promote the goals and policies of the Comprehensive Plan;

B. Promote economic vitality of the city's business districts and corridors;

C. Ensure that signs are compatible with the desired character and identity of Lacey and its various districts and corridors;

D. To recognize free speech rights by regulating signs in a content-neutral manner;

E. To promote the free flow of traffic and protect pedestrians and motorists from injury and property damage caused by, or which may be fully or partially attributable to, cluttered, distracting, and/or illegible signage;

F. To prevent property damage, personal injury, and litter from signs which are improperly constructed, poorly maintained, or of flimsy materials;

G. To protect property values, the local economy, and the quality of life by preserving and enhancing the appearance of the streetscape;

H. To provide consistent sign design standards;

I. To promote signs that are designed appropriate to the site's existing and planned context, including the size and characteristics of the site, the speed limit of the fronting street, and the envisioned character of the applicable area per adopted plans;

J. To provide an improved visual environment for the citizens of and visitors to the City and to protect prominent view sheds within the community; and

K. To enable the fair and consistent enforcement of these sign regulations.

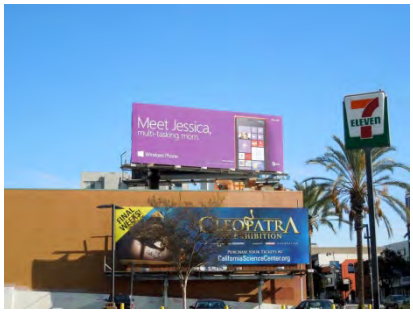
16.75.020 Definitions and abbreviations.

For the purpose of this chapter, definitions as defined in Chapter 16.06 LMC and certain abbreviations, terms, phrases, words and their derivatives shall be construed as specified in this section.

A. "Awning" is a temporary shelter supported entirely from the exterior wall of a building.

B. "Banner" is a flexible substrate on which copy or graphics may be displayed. For the definition of a projecting banner, see subsection (EE) below.

C. "Billboard" is a sign that directs attention to a business, commodity, service, or entertainment conducted, sold, or offered at a location other then the premises on which the sign is located.



D. “Bulletin board” means a sign so designed that the message may be changed by removal or addition of specially designed letters that attach to the face of the sign.

E. “Business sales event” means a special sales event put on by a private business. Examples could include a special seasonal or holiday-oriented sales event or a once a year sales event. See LMC 16.75.100.C.2 for signage associated with business sales events.

F. “Canopy” means an overhead structure attached to a building that provides weather protection for pedestrians. Awnings and marquees (defined herein) are different types of canopies.

G. “Construction sign” means any sign used to identify the architects, engineers, contractors or other individuals or firms involved with the construction of a building and announce the character of the building or the purpose for which the building is intended.

H. “Copy” means the graphic content or message of a sign.

I. “Departure” means a City approved alternative way to meet specific design standards set forth in this chapter. See LMC 16.75.040(C) for general information and procedures associated with departures.

J. “Digital sign” means a changeable copy sign that uses a matrix of illumination elements, such as light emitting diodes, (LED), liquid crystal display (LCD), plasma display, individual light bulbs, or other digital or analog electronic media to display or project copy which can be modified by electronic processes.

K. “Directional sign” means signs erected by the city on arterial streets directing the public to public, civic or nonprofit facilities.

L. “Dwell time” means the amount of time a particular image is on display.

M. “Fade” means a mode of message transition on a digital sign accomplished by varying the light intensity, where the first message gradually reduces intensity to the point of not being legible and the subsequent message gradually increases intensity to the point of legibility.

N. “Flashing sign” means any sign which contains an intermittent or flashing light source or which includes the illusion of intermittent or flashing light by means of animation or an externally mounted intermittent light source. Excluded from the definition are public service signs.

O. “Feather sign” means a vertical portable sign that contains a harpoon-style pole or staff driven into the ground for support or supported by means of an individual stand.

P. “Free-standing sign” means any sign which is supported by one or more uprights or braces in or upon the ground.

Q. “Garage sale signs,” i.e., yard sales, moving sales, patio sales, means temporary signs used to announce a sale of used items at a residence.

R. “Grade” means the elevation or level of the street closest to the sign to which reference is made, as measured at the street’s centerline, or the relative ground level in the immediate vicinity of the sign.

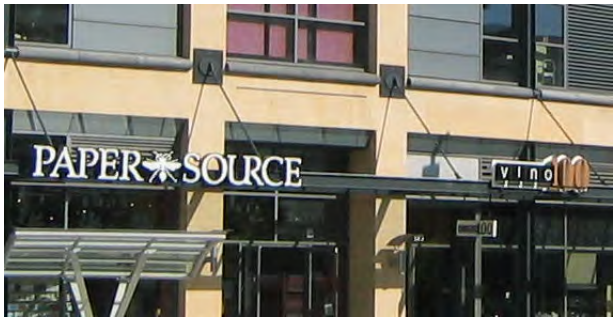
S. “Grand opening displays” means temporary signs, posters, banners, strings of lights, clusters of flags, balloons and searchlights used to announce the opening of a completely new enterprise or the opening of an enterprise under new management.

T. “Height” or “height of sign” means the vertical distance from the grade to the highest point of a sign or any vertical projection thereof, including its supporting columns.

U. “Internal way-finding sign” means a sign used to aid customers in circulation within parking lots of commercial uses.

V. "Legal nonconforming sign" means a sign which on the effective date of the ordinance codified in this chapter was lawfully maintained and had been lawfully erected in accordance with the provisions of any prior sign ordinance or code but which sign does not conform to the applicable limitations established by this chapter; or on or after the effective date of the ordinance codified in this chapter was lawfully maintained and erected in accordance with the provisions of this chapter but which sign, by reason of amendment of the ordinance codified in this chapter after the effective date thereof, does not conform to the applicable limitations established by the amendment of this chapter.

W. "Marquee" is a permanent roofed structure attached and supported by the building.



X. "Mobile sign" means a sign made of any material which by its design is readily movable and is equipped with wheels, casters or rollers or which is not permanently affixed to the ground, structure or building. (Also includes signs mounted upon the tops of vehicles.)

Y. "Monument sign" is a ground-mounted sign which is higher than three feet above the average ground elevation and which is attached to the ground by means of a wide base of solid appearance.

Z. “Multiple building complex” means a group of structures housing at least one retail business, office, commercial venture or independent or separate part of a business which shares the same lot, access and/or parking facilities.

AA. “Multiple occupancy building” means a single structure housing more than one retail business, office or commercial venture.

BB. “Nit” means a photometric unit of measurement referring to luminance. One nit is equal to one cd/m².

CC. “Off-premises sign” means a permanent sign not located on the premises of the use or activity to which the sign pertains.

DD. “Political sign” means a sign advertising a candidate or candidates for public elective office, or a political party, or sign urging a particular vote on a public issue decided by ballot.

EE. “Projecting sign” means a sign attached to a building or other structure and projecting away from the structure more than 12 inches.

FF. “Projecting banner sign” means a banner as defined in paragraph (B) above that is supported by poles or brackets which projecting away from a structure more than 12 inches.

GG. “Public service signs” means an electronically or electrically controlled public service sign or portion of a larger sign which conveys only information such as activities, events, time, date, temperature, atmospheric condition or news of interest to the general public where different alternating copy changes are shown on the same lamp bank matrix.

HH. “Real estate or property for sale, rental or lease sign” means any sign pertaining to the sale, lease or rental of land or buildings.

II. “Sandwich Board Sign” means a temporary sign made of metal, wood, chalkboard, or white board that is not permanently attached to the ground and generally oriented to pedestrians.

JJ. “Searchlight” means an apparatus containing an electric light and reflector on a swivel for projecting a far-reaching beam in any desired direction.

KK. “Sign” means any commercial communication device, structure or fixture that is intended to aid an establishment in identification and to advertise and/or promote a business, service, activity or interest. For the purpose of this chapter, a sign shall not be considered to be building or structural design, but shall be restricted solely to graphics, symbols or written copy that is meant to be used in the aforementioned way.

LL. “Sign area” means the entire area of a sign on which copy is to be placed, as set forth in LMC 16.75.050.E.

MM. “Special event signs” means temporary signs used to announce a public special event, such as a circus, a carnival, or festival, or a business sales event. See LMC 16.75.100.C for applicable standards.

NN. “Temporary sign” means any sign, banner, pennant, valance, flags (not intended to include flags of any nation, state, city or other governmental agency or non-profit organization), searchlights, balloons or other air-filled or gas-filled figures or advertising display constructed of cloth, canvas, light fabric, cardboard, wallboard or other light materials, with or without frame, intended to be displayed for a limited period of time only. Different types of temporary signs and banners included in this category are: construction, grand opening displays, real estate, special event, political, sandwich board, and garage sale.

OO. “Wall” means any member or group of members, which defines the exterior boundaries of a building and which has a slope of sixty degrees or greater with the horizontal plane. The height of a wall shall be measured as the two-dimensional height from the average finish grade of the particular architectural building elevation adjacent to the wall to the finish roof plane.

PP. “Wall sign” means any sign attached to or painted directly on the wall, or erected against the wall of a building being parallel or approximately parallel to said wall; and does not exceed a distance of fifteen inches from said wall.

16.75.030 Applicability.

A. Applicability. This chapter applies to all signs, of whatever nature and wherever located, within the City.

B. Interpretation. This chapter is not intended to, and does not restrict speech on the basis of its content, viewpoint, or message. Any classification of signs in this chapter that permits speech by reason of the type of sign, identity of the sign user, or otherwise, shall also be interpreted to allow non-commercial speech on the sign. No part of this chapter shall be construed to favor commercial speech over non-commercial speech. To the extent any provision of this chapter is ambiguous, the term shall be interpreted not to regulate on the basis of the content of the message.

C. Exemptions. The following signs do not require a sign permit (unless noted), nor shall the area and number of such signs be included in the area and number of signs permitted for any site or use. This shall not be construed as relieving the owner of the sign from the responsibility of its erection and maintenance and its compliance with the provisions of this chapter or any other law or ordinance:

1. The flag, emblem or insignia of a nation or other governmental unit or nonprofit organization subject to the guidelines concerning their use set forth by the government or organization which they represent. Flag poles require a building permit for structural review and are limited to the maximum height restrictions of the underlying zoning district.

2. Memorial signs or tablets, names of buildings, stained glass windows and dates of erection when cut into the surface or the facade of the building or when projecting not more than two inches.

3. Traffic or other municipal signs, signs required by law or emergency, railroad crossing signs, legal notices, and any temporary, or non-advertising signs as are authorized under policy approved by the city council.

4. Signs of public utility companies indicating danger or which serve as an aid to public safety or which show the location of underground facilities or of public telephones.

5. Flush mounted wall signs, used to identify the name and address of the occupant for each dwelling provided the sign does not exceed two square feet in sign area.

6. Signs located in the interior of any building or within an enclosed lobby or court of any building or group of buildings, which signs are designed and located to be viewed exclusively by patrons of such use or uses.

7. Decorations, such signs in the nature of a decoration, clearly incidental and customary and commonly associated with any national, local or religious holiday.

8. Painting, repainting or cleaning of an advertising structure or the changing of the advertising copy of message thereon shall not be considered an erection or alteration which requires a sign permit unless a structural change is made.

9. Sculptures, fountains, mosaics and design features which do not incorporate advertising or identification.

10. No trespassing", "no dumping", "no parking", "private", signs identifying essential public needs (i.e., restrooms, entrance, exit, telephone, etc.) and other informational warning signs, which shall not exceed three square feet in surface area.

11. Directional signs erected by the city on arterial streets directing the public to public, civic, or nonprofit facilities. Such signs shall be erected at the discretion of the director of public works and shall be subject to city design guidelines. In addition, the City may allow the erection of directional signs as are necessary to designate commercial areas or significant tourist sites within the city, consistent with the City's way-finding program.

12. Kiosks and other related informational signs that are placed along internal walkways that are designed specifically to be viewed by pedestrians and not intended to function as advertising to motorists on nearby public streets.

16.75.040 Administration.

A. Permits & Fees Required.

1. Subject to the exemptions set forth in LMC 16.75.030(C), no sign governed by the provisions of this code shall be erected, altered or relocated by any person, firm or corporation without a permit issued by the city.

2. Fees for sign permits shall be established by resolution of the city council.

3. Sign permits are subject to limited administrative review pursuant to Section 1C of the Development Guidelines and Public Works Standards (TO ADD LINK). Exception: For applications that include a departure, see subsection (C) below.

B. Permit Applications. Applications for permits shall contain the name and address of the owner and user of the sign, the name and address of the owner of the property on which the sign is to be located, the location of the sign structure, drawings or photographs showing the design and dimensions of the sign and details of its proposed placement and such other pertinent information as the administrator of this code may require to insure compliance with this code and other applicable ordinances. Permit applications shall be available for inspection by the public upon request. Upon completion of a permit application, the application should be acted on within two weeks unless there is a requirement for further time associated with an underlying land use application.

C. Departures. This chapter provides for a number of specific departure opportunities to sign design standards. The purpose is to provide applicants with the option of proposing alternative design treatments provided such departures meet the applicable departure criteria set forth for the applicable particular departure opportunity. Specifically:

1. Departures are voluntary. This provision allows the flexibility for applicants to propose alternative designs on a voluntary basis.

2. Applicability. Departure opportunities are available only to specific standards that allow for departures.

3. Procedures. Permit applications that include departure requests are subject to limited administrative review pursuant to Section 1C of the Development Guidelines and Public Works Standards. Departure requests, at the discretion of the Administrator, may be referred to the Hearing Examiner.

4. Approval criteria. Project applicants must successfully demonstrate to the administrator how the proposed departure meets the applicable criteria that applies to the specific standard.

5. Documentation. The administrator shall issue a written decision including findings documenting how the departure meets or exceeds the applicable criteria.

D. Administrator.

1. Appointment--Powers and duties generally. The administrator of this code shall be the Director of Community Development. The administrator is authorized and directed to enforce and carry out all provisions of this code, both in letter and spirit, with vigilance and with all due speed. To that end, the administrator is authorized to formulate procedures consistent with the purposes of this code. The administrator is further empowered to delegate the duties and powers granted to and imposed upon the Director of Community Development under this code. As used in this code, “administrator of this code” or “administrator” shall include the Director of Community Development’s authorized representative.

2. Inspection authority. The administrator is empowered to enter or inspect any building, structure or premises in the city upon which, or in connection with which, a sign, as defined by this code, is located, for the purpose of inspection of the sign, its structural and electrical connections and to insure compliance with the provisions of this code. Such inspections shall be carried out during business hours, unless an emergency exists.

16.75.050 Prohibited Signs.

A. Sign Location Restrictions. Except where specifically authorized by this chapter, signs are prohibited in the locations set forth below. Prohibited signs are subject to removal (except legal nonconforming signs as defined by this chapter) by the city at the owner’s or user’s expense.

1. Any temporary or permanent freestanding sign located within or projecting over a City right-of-way or within 5 feet of a City right-of-way. Sandwich board signs and feather signs meeting the provisions of LMC 16.75.100(H) and (I) are an exception.

2. Any sign attached to any public utility pole, structure or street light, tree, fence, fire hydrant, bridge, curb, sidewalk, park bench, statue, memorial, or other location on public property, except those signs approved as part of a special event permit on City property or banner signs permitted by the City on light poles in certain zones within the City. Nothing in this Section shall be construed to prohibit a person from holding a sign while located on City property so long as the person holding the sign is located on public property

determined to be a traditional public forum and does not block ingress and egress from buildings or create a safety hazard by impeding travel on sidewalks, bike and vehicle lanes, and trails;

3. Any sign, which by reason of its location, will obstruct the view of any authorized traffic sign, signal, or other traffic control device or which by reason of shape, color, or position interferes with or could be confused with any authorized traffic signal or device;

4. Any sign that interferes with safe sight distance at an intersection;

5. Any sign which is placed so as to prevent or inhibit free ingress to or egress from any door, window, or any exit way required by the Building and/or Fire Code currently in effect;

6. Any commercial, advertising, or business sign that is not located on the premises of the business to which it refers.

7. Signs located on roofs, except that **Departures** per LMC 16.75.040(C) will be considered where signs are placed in an architectural space that is specifically incorporated into the roof design and does not project higher than the peak of the roof; and

8. Any sign mounted, attached, or painted on a trailer, boat, or motor vehicle when parked, stored, or displayed conspicuously on private premises in a manner intended to attract attention of the public for the purpose of advertising or identifying the business premises. This provision excludes signs indicating the name of the owner or business that are permanently painted or wrapped on the surface of the vehicle, adhesive vinyl film affixed to the interior or exterior surface of a vehicle window, or signs magnetically attached to motor vehicles or rolling stock that are actively used in the daily conduct of the business. Such vehicles shall be operable and parked in a lawful or authorized manner.

B. Sign Display Restrictions.

1. Purpose. The purpose of this Subsection is to regulate the manner in which signs convey their messages by specifying prohibited display features that create distractions to the traveling public and create visual clutter that mar the natural and architectural aesthetics of the City.

2. Applicability. The display features set forth below are prohibited. Prohibited signs are subject to removal (except legal nonconforming signs as defined by this chapter) by the city at the owner's or user's expense.

   a. Any digital sign except for those associated with freestanding signs per LMC 16.75.080(A)(7);

   b. Any sign or lighting device, whether on the exterior of a building or on the inside of a window which is visible beyond the boundaries of the lot or parcel, or from any public right-of-way, with intermittent, flashing, rotating, blinking or strobe light illumination;

   c. Any sign with an exposed light source, except for neon incorporated into the design of the sign;

   d. Any sign which emits sound, odor, smoke, laser or hologram lights, or other visible matter, including any sign that uses motion picture projection;

   e. Any sign animated by any means, including fixed aerial displays, balloons, pennants, spinners, including strings of flags, streamers, tubes, or other devices affected by the movement of the air or other atmospheric or mechanical means, except when used for a Grand Opening Display or Special Event Signage per LMC 16.75.100(B) or (C);

f. Any sign in which the sign body or any portion of the sign rotates, moves up and down, or any other type of action involving a change in position of the sign body or any portion of the sign, whether by mechanical or any other means, except when used for a Grand Opening Display or Special Event Signage per LMC 16.75.090(B) or (C);

g. Changeable copy signs, except as provided for in LMC 16.75.030(C) for exempt signs and 16.75.080(A)(7) for freestanding signs; and

h. Mannequins holding a sign or displaying advertising, whether stationary or animated.

C. Other Prohibited Signs. Prohibited signs are subject to removal (except legal nonconforming signs as defined by this chapter) by the city at the owner's or user's expense. The following signs or displays are prohibited:

1. Mobile signs;
2. Strings of banners, pennants, and other graffiti-like material;
3. Freestanding signs except where permitted in LMC 16.75.080(A), 16.75.090, or 16.75.100; and
4. Billboards.

16.75.060 General Sign Provisions.

A. Sign Message. Any permitted sign may contain, in lieu of any other message or copy, any lawful non-commercial message, so long as the sign complies with the size, height, area, location, and other requirements of this Division.

B. Sign Area. Sign area for all sign types is measured as follows:

1. The area of painted signs, individual letter signs, and other indirectly illuminated signs shall be calculated on the basis of the smallest rectangle, circle or spherical figure that will enclose the entire copy area of the sign. Any such calculation shall include the areas between letters and lines, as well as the areas of any devices, illuminated or non-illuminated, which are intended to attract attention.
2. Only one side of a double-faced or three-faced sign shall be included;
3. Four or more faced signs, spherical, free-form, sculptural or other non-planar sign area is measured as 50 percent of the sum of the areas using only the four vertical sides of the smallest four-sided polyhedron that will encompass the sign structure, as shown in Figure 16.75.060(B). Signs with greater than four polyhedron faces are prohibited.

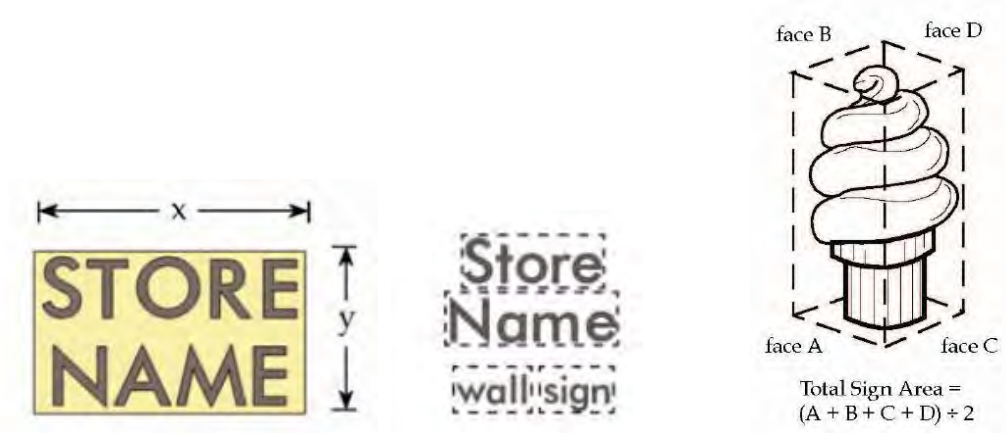


Figure 16.75.060(B). Clarifying sign area measurement.

F. Sign Illumination. Illumination from or upon any sign shall be shaded, shielded, directed or reduced so as to avoid undue brightness, glare or reflection of light on private or public property in the surrounding area, and so as to avoid unreasonably distracting pedestrians or motorists. "Undue brightness" is illumination in excess of that which is reasonably necessary to make the sign reasonably visible to the average person on an adjacent street. Illumination, if used, shall be what is known as white or yellow and shall not be blinking, fluctuating or moving. Light rays shall shine only upon the sign or upon the property within the premises and shall not spill over the property lines, in any direction, except by indirect reflection.

C. Sign Structure and Installation.

1. Structural requirements. The structure and erection of signs or flag poles within the city shall be governed by the city's adopted Building Code. Compliance with the Building Code shall be a prerequisite to issuance of a sign permit under this code.

2. Electrical requirements. Electrical requirements for signs within the city shall be governed by the National Electrical Code. Compliance with the National Electrical Code shall be required by every sign utilizing electrical energy as a prerequisite to issuance of a sign permit under this code.

D. Sign Maintenance and Inspection.

1. Maintenance. All signs, including signs heretofore installed shall be constantly maintained in a state of security, safety, appearance and repair. If any sign is found not to be so maintained or is insecurely fastened or otherwise dangerous, it shall be the duty of the owner and/or occupant of the premises on which the sign is fastened to repair or remove the sign within five days after receiving notice from the administrator. Where a sign is determined to be an immediate hazard by the administrator, the sign is subject to immediate repair or removal. The premises surrounding a free-standing sign shall be free and clear of rubbish and landscaping area maintained in a tidy manner.

2. Inspection. All sign users shall permit the periodic inspection of their signs by the city upon city request.

16.75.070 Permitted Signs

This section identifies the permitted types of signs by use and/or district.

A. Permitted types of signs by use and/or district.

Table 16.75.070. Permitted types of signs by use and/or district. An "X" in the table indicates that the particular type of sign is allowed for the applicable land use and/or zone. See applicable sign type provisions in Section 16.75.080 for possible exceptions to the provisions below.

	SIGN TYPE					
Land Use and/or Zone	**Free-standing** 16.75.080(A)	**Wall Sign** 16.75.080(B)	**Marquee/ Awning** 16.75.080(C)	**Projecting Sign** 16.75.080(D)	**Under Canopy** 16.75.080(E)	**Internal Way-finding** 16.75.080(F)
Non-Residential Uses						
Any non-residential use	X	X	X	X	X	X
Multi-occupancy building	X	X	X	X	X	X
Multi-building complex	X	X	X	X	X	X
Large Shopping Center	X	X	X	X	X	X
Freeway Oriented Business	X	X	X	X	X	X
Residential Uses						
Single Family Subdivision	X					
Mixed Residential or Multi-family Complex	X					
Home occupation		X				
Mobile home subdivisions & parks	X	X				

X = Permitted sign

B. One bulletin board limited to 50 square feet in area is allowed for each public, charitable or religious institution where the same are located on the premises of said institution. A sign permit is required.

16.75.080 Sign Type Standards.

A. Freestanding Signs.

1. Visualization required. All applicants for freestanding signs associated with multi-tenant commercial centers and individual non-residential uses over 5,000 square feet shall include a photo simulation of the proposed sign from at least two prominent public viewpoints. Applicants may use photographs or Google Earth or other clearly legible online street view resource to superimpose their proposed sign. See Figure 16.75.080(A)(1) below for an example.

Figure 16.75.080(A)(1). Examples of the types of sign visualizations that are useful to determine compliance with the standards herein. The left image uses Google Earth as a base to which to illustrate the proposed sign. The right image uses an actual photograph and superimposes the proposed sign.

2. Sign form. Freestanding signs shall be designed so they appear firmly anchored to the ground. This includes:

   a. Monument signs, as defined in 16.75.020(Y).

   b. Signs where the base (where the sign structure meets the ground plane) is at least 40 percent of the width of the total sign width. **Departures** per LMC 16.75.040(C) will be considered provided the sign includes design features that visually anchor it to the ground and the design of the sign meets other applicable standards.

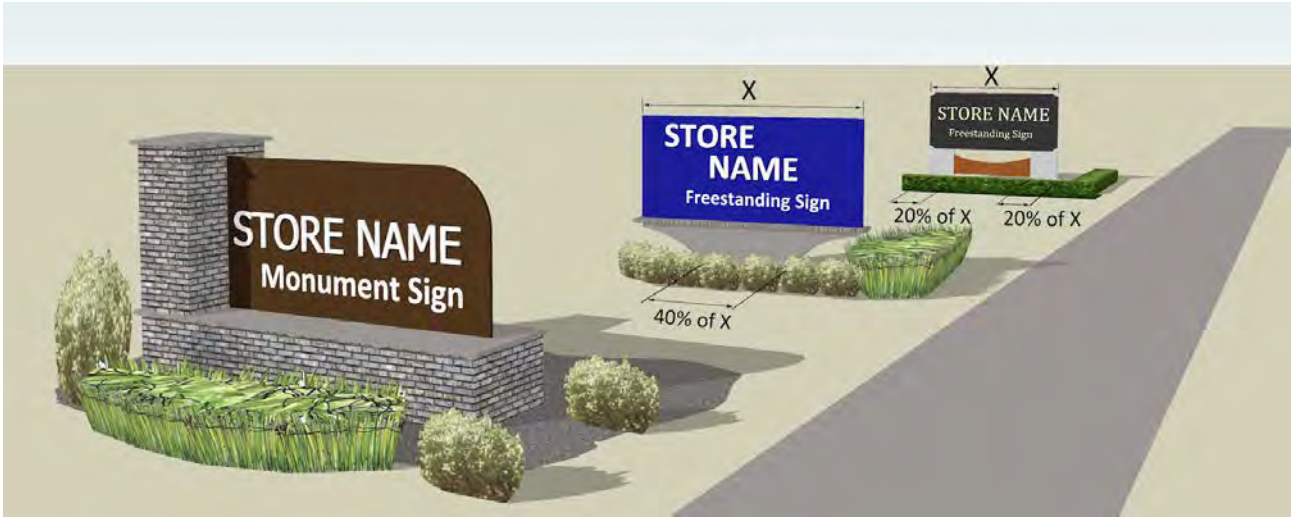


Figure 16.75.080(A)(2). Minimum ground anchoring provisions for free-standing signs.

3. Permitted number of signs. One sign is permitted per frontage, per property. Additional freestanding signs shall be permitted per Table 16.75.080(A)(3) below.

Table 16.75.080(A)(3). For properties with more than 500 feet of frontage, additional freestanding signs are permitted per the separation standards below.

Applicable Speed Limit	Minimum Separation
Less than 35 mph	150’
35-45 mph	200’

Figure 16.75.080(A)(3). An example of a shopping center with a large frontage where multiple freestanding signs are allowed. The fronting street has a posted speed limit of 35 miles per hour, which requires a minimum sign separation of 200 feet.

4. Materials and design. Freestanding signs shall be designed as an integrated architectural feature of the site. Specifically:

   a. Framing. Freestanding sign must include design elements that effectively frame the sign on both sides [see Figure 16.75.080(A)(4)(c-1) and (c-2) for acceptable examples]. Alternatively, signs that have a substantial framing element on one side, as illustrated in the examples in Figure 16.75.080(A)(4)(c-3), will meet this provision. **Departures** per LMC 16.75.040(C) will be considered provided the design meets other provisions herein, integrates a distinctive, one-of-a-kind design that contributes to the visual character of the area.

   b. Materials and design. Freestanding signs shall include durable high quality materials and a design that relates to and/or complements the design of on-site buildings and/or is coordinated with other site design elements (such as distinctive lighting, monuments, way-finding signs). Figures 16.75.080(A)(4)(c-1-3) below all meet this requirement.

   c. Top/middle/bottom. Freestanding signs shall integrate a top, middle, and bottom element. The top could include a distinctive sign cap and/or include the name of a multi-tenant center. The middle can include a consistent framing technique for an individual sign or multiple signs in a multi-tenant center. The bottom could include a distinctive base design with special materials and/or design. See the figures below for examples that meet this requirement. These components are less critical for signs less than 6 feet tall, and thus exempt from this provision.

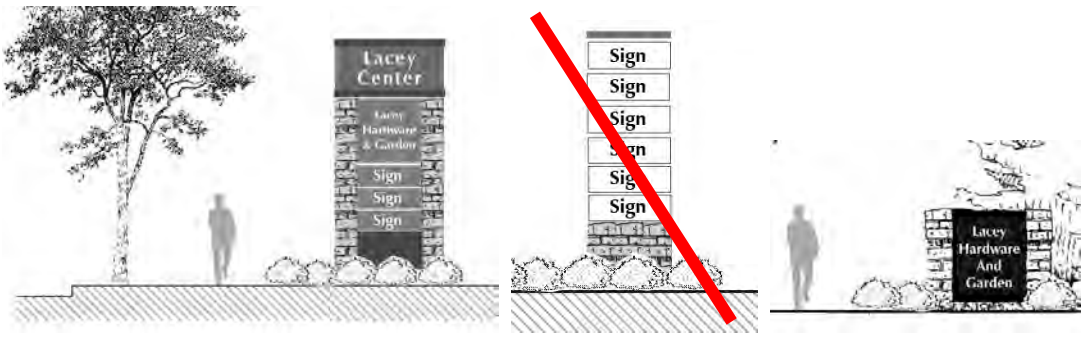


Figure 16.75.080(A)(4)(c-1). Illustrating acceptable and unacceptable freestanding sign examples. The left image utilizes a clearly identifiable top, middle, and bottom elements and meets the framing provision. The middle image includes a base, but insufficient top or framing element. The shorter sign to the right includes framing but is exempt from the top, middle, and bottom elements.

Figure 16.75.080(A)(4)(c-2). Each of these three signs includes a frame, top/middle/bottom components, and feature high quality materials that relate to and/or complement the design of on-site buildings and/or is coordinated with other site design elements.

Figure 16.75.080(A)(4)(c-3). These signs feature substantial framing elements on one side, and thus meet the design provisions herein.

Figure 16.75.080(A)(4)(c-4). Unacceptable signs. The far left sign includes a base and a frame, but no identifiable top. The middle and right signs fail to meet any of the design provisions above.

5. <u>Location and landscaping.</u>

   a. Setback. All freestanding signs shall be located at least 5 feet from a public ROW unless a greater setback is specified herein.

   b. Landscaping. All signs shall include landscaping around the base of freestanding signs to enhance the character of street frontages. Specifically, at least one square foot of landscaped area shall be provided per 1 square feet of sign area. Utilize plants and a maintenance program to minimize conflicts with the sign.

   c. Base height provision. The copy of all signage shall be at least 1-foot above grade. The purpose is to allow vertical space for the required landscape elements and enhance the visibility of sign copy. See Figure 16.75.080(A)(5).

Figure 16.75.080(A)(5). Minimum base height for sign copy.

6. Maximum size and height. Table 16.75.080(A)(6) illustrates the maximum allowable sign area and height for all freestanding signs, except such signs for freeway-oriented businesses, as set forth LMC 16.75.080(A)(10).

Table 16.75.080(A)(6). Maximum freestanding sign height and area.

Total ROW Frontage of Parcel (on each streets)	**Allowable Sign Area** (white/very light background)	**Allowable Sign Area** (shaded or dark background)	**Maximum Height** (white/very light background)	**Maximum Height** (shaded or dark background)
< 200 Feet	24 sq. ft.	40 sq. ft.	6 feet	7 feet
200 - 399 Feet	36 sq. ft.	54 sq. ft.	7 feet	8 feet
400 - 599 Feet	50 sq. ft.	70 sq. ft.	8 feet	9 feet
600 - 799 Feet	60 sq. ft.	80 sq. ft.	8 feet	10 feet
800 - 999 Feet	66 sq. ft.	88 sq. ft.	9 feet	12 feet
1000 Feet and >	72 sq. ft.	96 sq. ft.	9 feet	15 feet

Supplemental Freestanding sign provisions:

a. Signs that employ shaded, opaque or dark background and light colored lettering for at least 50 percent of the sign copy are allowed larger sign areas, as they are found to be less visually intrusive than signs incorporating white or very light-colored background. Using a CMYK color chart, signs that employ color numbers that add up to at least 20 (collectively) shall be considered as "shaded". For example:

C=0, M=0, Y=0, K=20 = Shaded

C=10, M=0, Y=0, K=10 = Shaded

C=10, M=0, Y=0, K=0 = Not considered to be Shaded

See Figure 16.75.080(A)(6)(a) below for examples.

Figure 16.75.080(A)(6)(a). The black, dark, and shaded signs above qualify for the extra sign area and height specified in the shaded columns of Table 16.75.080(A)(6). The sign on the right with the white background is allowed (but doesn't qualify for the "bonus" sign area and height) and subject to the sign area/height in the unshaded columns above in Table 16.75.080(A)(6).

b. Departures. Applicants seeking a larger and/or taller sign may apply for a departure per LMC 16.75.040(C) to allow for sign height and area up to 50 percent greater than specified above. In order to qualify for a departure, signs shall include a distinctive one-of-a-kind design that includes a high quality mixture of materials.

Figure 16.75.080(A)(6)(b). The sign on the left is an example of a sign that meets basic standards, whereas the sign on the right uses a distinctive one-of-a-kind design and would qualify for a departure.

c. Center names for multi-tenant commercial centers (centers that include two or more tenants) are exempt from allowable sign area calculations specified above, provide the center name is distinct from the names of any tenants (for example, Joe's Center would be too closely related to a tenant name Joe's Books). Freestanding signs incorporating center names are allowed 15 percent greater sign height than specified above.

Figure 16.75.080(A)(6)(c). Examples of sign integrating center names (exempt from sign area calculations).

d. For those properties where more than one freestanding sign is allowed on a particular frontage per subsection (3) above, one sign may be installed per standards specified per the Total ROW frontage of the parcel. The size and height of additional signs is based on the separation from the larger primary sign or other supplemental sign. For example, if a second sign is 650 feet from the larger primary sign, then it shall meet the standards for a sign that includes 600-799 feet of Total ROW Frontage of Parcel as set forth in the table above.

e. Large commercial shopping center signs and freeway-oriented signs [see subsections (9) and (10) below] are exempt from the standards above.

7. <u>Digital signage integration.</u> Digital signage elements may be integrated into any freestanding sign permitted in this subsection, subject to the following provisions:

a. Up to 50 percent of allowed sign copy area may be used for digital directory purposes. This would allow a multi-tenant center to rotate the names of businesses used in the freestanding signs, allowing greater visibility opportunities for individual businesses in the center.

b. Up to 33 percent of allowed sign copy area may be used for changing message purposes. For single tenant signs, up to 50 percent of the allowed sign copy area may be used for changing message purposes.

c. Where both a digital directory and changing message signage is included on one freestanding sign, such elements may collectively be used for up to 67% of the total allowed sign copy area.

Figure 16.75.080(A)(7). The sign above features digital directory signage (Tahitian Pearls, which occupies 33% of the sign copy) and digital signage that features changeable messages (bottom 33% of sign copy) The combined digital signage represents the maximum 67% of the total sign copy area.

d. Any form of technology may be used for the sign elements described herein, provided they meet the following provisions:

   i. Maintain a 10 second minimum dwell time for the directory and any images. Changes in directory and images shall be a simple fade with a maximum transition time of two seconds. Animation, movement or video imaging is prohibited.

   ii. Brightness limits:

      - Integrate automatic dimming capability that adjusts to the brightness of ambient light at all times of the day and night;
      - Daytime, based on the time from sunrise to sunset as calculated for Lacey, WA: 5,000 maximum nits (a measure of luminance that will keep signage balanced with surrounding landscape); and
      - Nighttime, based on the time from sunset to sunrise as calculated for Lacey, WA: 150 maximum nits (a measure of luminance comparable to typical nighttime signage and in-line with the Illuminating Engineering Society of North America (IESNA)

   iii. Light trespass standards – adopt a trespass limit of 0.1 foot-candles at the property line of any park or residential property.

   iv. Digital imagery may be used provided it meets the provisions of subsection (i) above.

e. Program required. Applicants proposing any forms of signage described above shall submit a program of their sign proposal describing how it will meet the applicable standards.

8. <u>Clutter management standards.</u>

a. Purpose. To reduce visual clutter along commercial corridors and improve sign legibility.

b. Applicability. The following standards apply to non-digital signage. The provisions shall serve as recommendations to be encouraged (not required) for digital signage copy to enhance legibility and minimize visual clutter.

c. Sign information allowances. The provisions herein use the street graphics approach to place limits on the amount of information used on signs based on applicable speed limit of the fronting street. Table 16.75.080(A)(8)(b) below identifies the permitted items of information that are allowed on a sign. Each word or graphic is considered an item of information. Each grouping of numbers is considered an item of information (for example, 867-5309 is considered two items of information). Shopping center names not related to an individual business are exempt from the information limit provisions herein.

Table 16.75.080(A)(8)(b). Sign information allowance table.

	Items of Information				
	Sign Area				
Speed Limit	Up to 24sf	24-35.9sf	36-49.9sf	50-80sf	80sf+
25 mph	18	20	22	26	30
30 mph	14	16	20	22	25
35 mph	12	14	16	18	20
40 mph	10	11	12	14	15
Freeway	10	10	10	10	10

Departures per LMC 16.75.040(C) will be considered allowing up to 33 percent more pieces of information on a sign provided the applicant demonstrates that the design of the sign in its context, is legible and successfully employs techniques to minimize visual clutter.

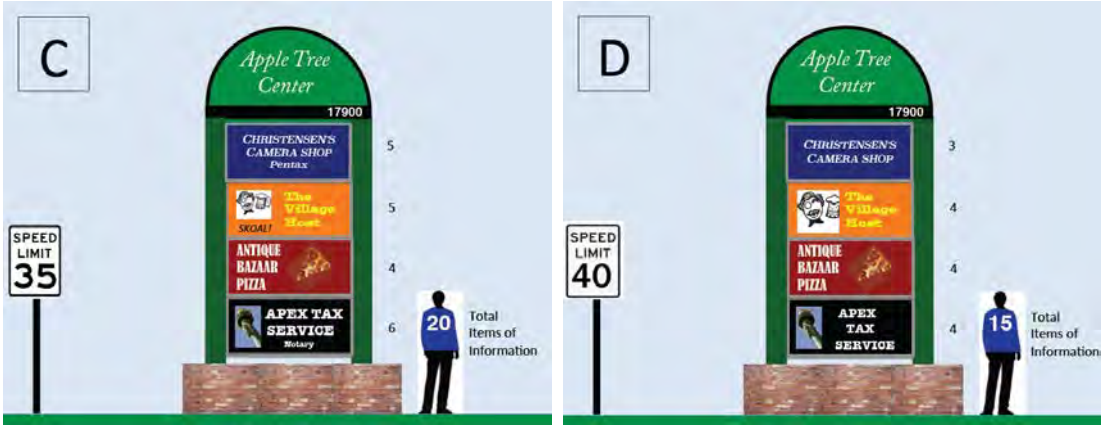


Figure 16.75.080(A)(8)(b-1). Illustrating signs that conform to the sign information allowance provisions.

Figure 16.75.080(A)(8)(b-2). An example of a 24 square foot sign in a 35 miles per hour zone meeting the maximum 12 pieces of information requirement. Note that the center name "Lacey Place" does not count as an item of information.

9. <u>Freestanding signs for large shopping centers.</u> A shopping center or other large commercial complex constituting a commercial subdivision or subject to a binding site plan and being more than 30 acres in size and more than 350,000 square feet in gross floor area of buildings is permitted one shopping center or commercial complex sign not exceeding 30 feet in height and 300 square feet in sign area. If the site has a sign for a freeway oriented business as permitted in LMC 16.75.080(A)(10) that can be seen and provides reasonable identification from all arterial frontages adjacent to the site, that sign shall count as the shopping center or commercial complex sign and no such additional signs shall be permitted. Provided, however, if the administrator determines that the freeway oriented sign does not provide reasonable identification from other arterial streets, both a shopping center or commercial complex sign and a freeway oriented sign may be permitted. Signs under this provision

will have a monument style. Provided, the Community Development Director shall have the authority to approve a modified sign design if due to height or other design considerations such a monument sign would be impractical or inappropriate. All such signs must be located at least 20 feet from all property lines and rights-of-way and subject to other applicable freestanding sign provisions above.

10. Freestanding signs for freeway-oriented businesses. Shopping centers and commercial complexes with significant freeway frontage are permitted freeway-oriented signs under the following criteria:

    a. Such shopping centers or other commercial complexes must have a minimum of 1,100 feet of frontage along a freeway. A frontage road or other right-of-way between the site and the freeway does not disqualify the site. Further, such shopping center or commercial complex must constitute a commercial subdivision or be subject to a binding site plan and must also be more than 30 acres in size and have more than 350,000 square feet of gross floor area of buildings.

    b. Such shopping centers may place one sign on the property for every 1,100 feet of freeway frontage not to exceed three total signs for the individual shopping center.

    c. A freeway oriented sign shall not exceed 30 feet in height from the roadway curb elevation or development natural grade, whichever is higher. A freeway oriented sign shall not exceed 300 square feet in sign area. Such sign must be located at least 20 feet from all property lines and rights-of-way.

       Departures per LMC 16.75.040(C) to the size and height of such freeway-oriented signs will be considered provided they meet the following criteria:

       i. Sign incorporates a distinctive one-of-a-kind design that complements the architectural design of the center building(s).

       ii. Sign employs opaque or dark sign background with light colored lettering;

       iii. Sign is generally no taller than is physically necessary to be clearly visible from Interstate 5 traffic given the context of the site utilizing view corridors and gaps in the tree canopy to blend in with the natural and built environment.

    d. Signs qualifying as a freeway oriented sign may be in addition to non-freeway oriented signs identifying businesses.

    e. Signs shall be fully enclosed with no exposed conduits or switchgear and any transformers associated with the sign shall be landscaped from view by the public.

11. Address Numbers. Legible address numbers are required on all free-standing signs. Such address numbers are exempt from sign area standards.

B. Wall Signs.

1. Permitted number of signs.

    a. Tenants are allowed a maximum of one wall sign per facade that is visible from a street or customer parking lot.

    b. Businesses may include additional smaller signs describing the types of products and/or services that the business offers, provided the sign areas collectively comply with maximum size requirements.

c. Commercial tenants on upper levels may include a wall sign placed on façade above the business provided the permitted sign area shall be shared with tenant below and the location/design meets the applicable standards in this subsection.

2. Location and design.

a. Wall signs shall be centered, proportional, and shaped to the architectural features of the buildings. Signage shall not exceed 2/3 of individual storefront dimension. This standard also applies to upper level businesses.

b. Wall signs shall not cover windows, building trim, an existing building name sign, or special ornamentation features. Preferred areas for installation of wall signs include blank areas above canopies, areas between vertical piers or columns, blank areas on a gabled roof, or upper reaches of a false fronted building.

c. Stacked words on wall signs are permitted. Generally, the primary business name should be provided on one line (though exceptions are permitted if they meet other applicable standards herein), with additional text on rows above and/or below providing supporting information about the business in smaller fonts.

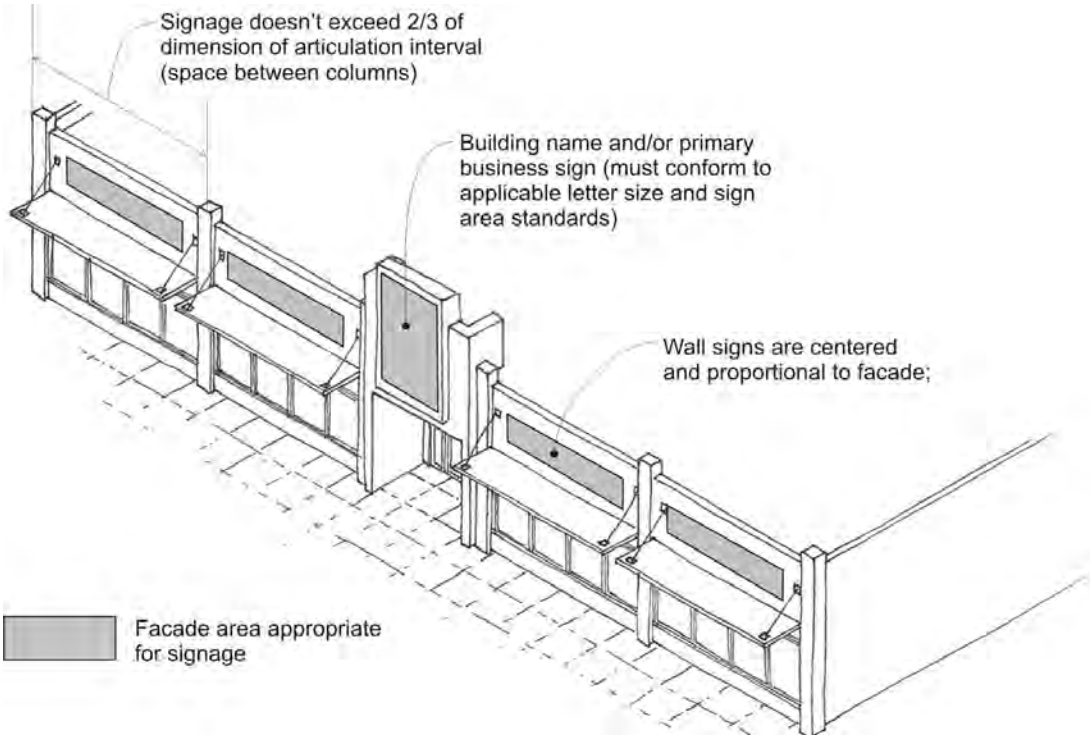


Figure 16.75.080(B)(2). Wall sign standards.

3. <u>Maximum size – individual retailers.</u>

Sign area. Table 16.75.080(B)(3) below provides standards for the maximum amount of wall, canopy, or awning signage on each building elevation. For building elevations that include signage for upper level businesses, the standards shall apply to the entire building elevation.

Table 16.75.080(B)(3). Sign area standards for wall, canopy, or awning signs for each building elevation.

Architectural building elevation wall area	Maximum sign surface area (for that wall area)
Below 200 sf	25% of the facade
200 - 349 sf	22.5% of the facade
350 - 499 sf	20% of the facade
500 - 999 sf	17.5% of the facade
999 - 1499 sf	15% of the facade
1500-1999 sf	12.5% of the facade
Over 2000 sf	10% of the facade

Departures per LMC 16.75.040(C) for larger signs will be considered provided the sign does not feature internal lighting and meets other applicable standards herein.

Figure 16.75.080(B)(3-1). Acceptable wall sign examples. Note the different styles of signs and use of stacked (both left images) and supplemental text (lower left).

Figure 16.75.080(B)(3-2). More acceptable wall sign examples. In the right image, the signs are centered on the articulation elements of the façade.

Figure 16.75.080(B)(3-3). Unacceptable wall sign example. Most or all of these signs clearly exceed 2/3's of the width of their respective individual storefronts.

4. Maximum height. Wall signs may not extend above the building parapet, soffit, the eave line or the roof of the building.

5. Mounting.

   a. Building signs should be mounted plumb with the building, with a maximum protrusion of 1-foot unless the sign incorporates sculptural elements or architectural devices.

   b. The sign frame shall be concealed or integrated into the building's architectural character in terms of form, color, and materials.

6. Building name signs. Signs that advertise the name of the building and not associated with the name of any individual business are exempt from the sign area standards set forth in Table 16.75.080(B)(3). above. Standards:

   Signs shall be placed near the top of the façade and generally centered on the architectural features of the building. **Departures** per LMC 16.75.040(C) will be considered provided the sign is located in a place that is independent from individual businesses on the building and helps to provide identity for the particular building.

Figure 16.75.080(B)(6). Building name signs. The left image is a good example. The image on the right shows an unacceptable example where new signage blocks the original building name sign (circled on top).

C. Marquee and Awning Signs. Marquee or awning signs may be used in place of permitted wall signs (except where otherwise specified herein), provided they meet the following conditions:

1. Permitted number of signs. Tenants are allowed a maximum of one marquee or awning sign per facade that is visible from a street or customer parking lot. Exception: where an individual business uses multiple awnings or marquees, additional signs may be included on these provided they meet other applicable standards herein.
2. Sign area. See Table 16.75.080(B)(3) above for maximum sign area.
3. Sign width. Signage shall not exceed 2/3 of individual awning or marquee width.
4. Letter height. The lettering height shall be proportional to the architectural features of the building. For example, is shall not be so large that it blocks windows or other significant architectural features of the building.
5. Vertical clearance. Signs shall be placed a minimum of 8 feet above the sidewalk or walkway.
6. Location: Marquee signs may be placed on the front, above, or below the marquee.
7. Content: For individual storefronts that include multiple awnings or marquees, secondary business signage may be included on the additional signs. For example, where the primary sign might advertise the name of a bakery, the secondary signs could advertise coffee, ice cream or other types of products sold by the business, provided they are sized smaller than the primary business sign and meet other standards herein.

Figure 16.75.080(C)(6-1). Marquee and awning sign examples & standards.

Figure 16.75.080(C)(6-2). Marquee and awning sign examples.

D. Projecting Signs. Projecting signs meeting the following conditions are allowed for commercial uses adjacent to and facing a street. They may be used in addition to wall, marquee, and/or awning signs provided they meet the applicable standards below.

1. Permitted number of signs.
   a. Projecting signs. Tenants are allowed a maximum of one projecting signs wall sign per facade that is visible from a street or customer parking lot. **Departures** per LMC 16.75.040(C) for additional projecting signs may be permitted along a building elevation provided:
      i. They are separated enough to avoid visual clutter, don't conflict with wall, marquee, and/or awning signs or other significant architectural features of the building.
      ii. Additional sign(s) are noticeably smaller in size than the primary business identification projecting sign.
      iii. Additional sign(s) advertise other products or aspects of the business and are not merely a second business sign.
   b. Projecting banner signs. Multiple projecting banner signs may be integrated on the building provided they are aligned with façade articulation elements (such as vertical columns or piers). See Figure 16.75.080(D-4) for an example.
2. Sign area. Projecting signs are not based on sign area standards, but on the dimensional standards below. Projecting signs may be either vertical or horizontal oriented. Projecting banner signs must all be vertically oriented.
   a. Projection:
      i. Horizontal oriented signs: No more than 8 feet;
      ii. Vertically oriented signs: No more than 42 inches for single-story buildings, no more than 5' for multi-story buildings;
      iii. Signs may project into public rights-of-way for storefront buildings, but shall not extend over the curb into the travel lane.
   b. Height:
      i. Horizontal oriented signs: No more than 3 feet;

ii. Vertically oriented signs: Shall not extend above the building parapet, soffit, the eave line or the roof of the building, except for theaters, hotels, large scale retail uses (over 50,000sf floor area), place names for large retail centers (over 75,000sf floor area), or places of public assembly.

c. **Departures** per LMC 16.75.040(C) to the provisions in subsection (a) and (b) above will be considered provided the sign design is compatible with the design of the building in terms of location, scale, and design elements, doesn't create a public safety hazard, and provides a positive contribution to the streetscape.

3. Vertical clearance. Signs shall be placed a minimum of 8 feet above the sidewalk or walkway.

4. Location: Projecting signs shall not be located directly over windows or in conflict with other signs or architectural features of the building.

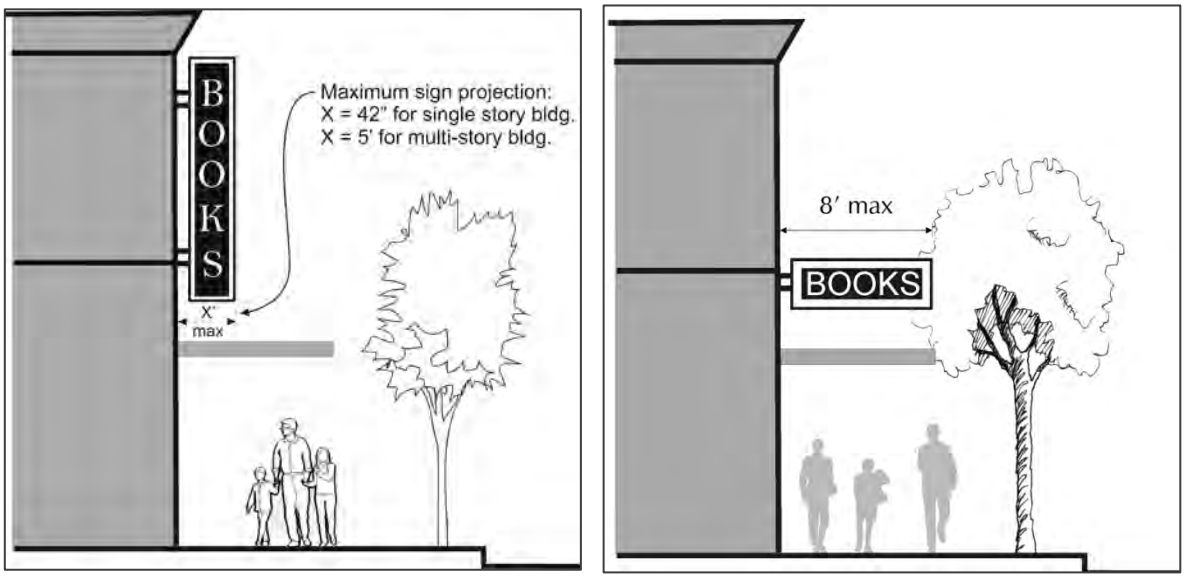


Figure 16.75.080(D-1). Standards for vertical (left) and horizontal-oriented (right) projecting signs.

Figure 16.75.080(D-2). Projecting sign examples. The example on right includes two complementary projecting signs that are separated enough that they don't conflict or cause visual clutter. The second sign is smaller and advertises the lounge that's within the restaurant.

Figure 16.75.080(D-3). Unacceptable projecting signs. Examples both include signs that project over the roofline. In the right example there are far too many signs. The extra signs also conflict visually and create unwanted sign clutter.

Figure 16.75.080(D-4). Projecting banner sign examples. Note how the sign are aligned with the vertical piers of each building and feature consistent bracket design.

E. Under Canopy Signs. Under canopy signs are placed under awnings, marquees or canopies and placed perpendicular to the storefronts and thus oriented to pedestrians on the sidewalk or an internal walkway. Applicable standards:

1. Permitted number of signs. Tenants are allowed a maximum of one marquee or awning sign per facade that is visible from a street or customer parking lot. Exception: For businesses with multiple entries onto a sidewalk or walkway, one under canopy sign shall be permitted for each entrance.

2. Sign width. Under canopy shall have 1-foot minimum between the sign and the outer edge of the marquee, awning, or canopy and between the sign and the building facade.

3. Sign height. Under canopy signs shall not exceed 2 feet in height.

4. Vertical clearance. Signs shall be placed a minimum of 8 feet above the sidewalk or walkway.

Figure 16.75.080(E). Under canopy standards and example.

F. Internal Way-finding Signs.

1. Purpose. To aid visitors in finding the location of a business, use or building.
2. Sign content. Signs may include only the name of the business, use, or building together with the directional guidance information.
3. Location. Signs may be located on internal walkways or landscape islands provided they don't inhibit pedestrian movement along the pathway.
4. Size. Signs may be up to 5 feet height and contain no more than 15 square feet in sign area.
5. Design. Signs shall designed in a uniform manner (within individual subdivision or center) using consistent background color typeface colors. Dark background colors with light colored text are preferred. See Figure 16.75.080(F) for an example.

Figure 16.75.080(F). Internal circulation sign examples. Note the consistent design themes using dark backgrounds with light colored text.

16.75.090 Residential District Sign Standards

A. Nonresidential uses within residential districts. Each use is permitted one monument sign as described in Table 16.75.080(A)(6). Internally lit signs in residential districts are prohibited.

B. Home occupations. Home occupation signs relate to home occupation as defined in the zoning ordinance. The sign shall be flush-mounted and shall not exceed 2 square feet in area, and cannot be internally illuminated, but may be indirectly illuminated.

C. Single-family subdivisions and mobile or manufactured home parks or subdivisions. Two signs may be permitted per entrance from an access street, provided said signs do not exceed 18 square feet in sign area each and 5 feet in height. Such signs can be low profile monument or fence mounted, and can be placed anywhere on the property along access streets, not necessarily at entrances.

D. Multi-family complex. Each multi-family complex is permitted one sign per entrance from an access street provided said signs do not exceed 24 square feet in sign area each and 6 feet in height. Rental information such as contact name and phone number can be included as a subservient portion of this sign. Such signs can be a monument or fence mounted.

16.75.100 Temporary Signs

The following signs are classified as temporary (non-permanent). Temporary signs are permitted subject to the applicable limitations:

A. Construction signs. A sign permit is required. Such signs may be displayed only after a building permit is obtained and during the period of construction on the construction site. Only one such sign is permitted per construction project for each public street upon which the project fronts. The applicable limits are as follows:

1. In all zones other than single-family residential zones, no construction sign shall exceed thirty-two square feet in sign area (printed copy on one side only) or ten feet in height, nor be located closer than ten feet from the property line or closer than thirty feet from the property line of the abutting owner.

2. In single-family residential zones, no construction sign shall exceed thirty-two square feet in sign area (printed copy on one side only) or ten feet in height, nor be located closer than ten feet from the property line of the abutting owner.

B. Grand opening displays. No sign permit is required. Such temporary signs, posters, banners, strings of lights, clusters of flags, balloons or other air or gas filled figures, and searchlights are permitted for a period of seven days only to announce the opening of a completely new enterprise or the opening of an enterprise under new management. All such materials shall be removed immediately upon the expiration of seven days. Such displays are permitted only in districts where the enterprise so advertised is allowed under district zoning regulations. Searchlights may be permitted by any business or enterprise provided the beam of light does not flash against any building or does not sweep an arc of forty-five percent from vertical.

C. Special event signs.

1. Public special event.

   a. Special event signage as defined in LMC 16.75.020.MM is allowed subject to the standards contained in this chapter.

   b. No sign permit is required.

c. Period of display. Such signs may be displayed 30 days prior to an event and must be removed within seven days after the event's conclusion.

d. Standards. Such temporary signs shall not be larger than four square feet. Said signs shall not be located in the right-of-way, posted or attached to telephone poles, power poles or other public utility facilities. The event committee for which the sign is displayed shall be responsible for its removal and subject to the penalties as provided in this code. Searchlights may be permitted by any business or enterprise provided the beam of light does not flash against any building or does not sweep an arc of 45 percent from vertical.

2. Business sales event.

a. A sign permit is required, specifying event periods and other information ensuring conformance with the standards herein.

b. Period of display: No more than 30 days in a calendar year. This may include up to four events in a calendar year provided the total number of days the sales event signage is displayed for does not exceed 30.

c. Standards: Sales event signage may include posters, banners, strings of lights, clusters of flags, balloons or other air or gas filled figures. Such displays are permitted only in districts where the enterprise so advertised is allowed under district zoning regulations.

D. Real estate signs. No sign permit is required. All exterior real estate signs must be of wood or plastic or other durable material. The permitted signs, with applicable limits are as follows:

1. Residential "for sale" and "sold" signs. Such signs shall be limited to one sign per street frontage not to exceed 5 square feet in sign area, placed wholly on the property for sale, and not to exceed a height of 7 feet.

2. Residential directional "open house" signs. Such signs shall be limited to one sign per street frontage on the premises for sale and 3 off-premises signs. However, if a real estate broker has more than one house open for inspection in a single development or subdivision, he/she is limited to 4 off-premises "open house" signs in the entire development or subdivision. Such signs are permitted only during daylight hours and when the real estate broker is in attendance at the property for sale. No such sign shall exceed five square feet in sign area.

3. Undeveloped commercial and industrial property "for sale or rent" signs. One sign per street frontage advertising undeveloped commercial and industrial property for sale or rent. The sign shall not exceed 32 square feet in sign area and 7 feet in height.

4. Developed commercial and industrial property "for sale or rent" signs. One sign per street frontage advertising a commercial or industrial building for rent or sale is permitted while the building is actually for rent or sale. If one face of the building is less than 10 feet from the building line, the sign shall be placed on the building or in a window. The sign shall not exceed 7 feet in height and, if free-standing, shall be located more than 15 feet from any abutting property line or a public right-of-way line. Said sign shall not exceed 32 square feet in sign area.

5. Undeveloped residential property “for sale” signs. One sign per street frontage advertising undeveloped residential property for sale is permitted not exceeding 32 square feet in sign area. Said sign must be placed more than 30 feet from the abutting owner’s property line and may not exceed a height of 7 feet.

6. Subdivisions approved after the effective date of this ordinance are permitted one cluster of flagpoles (not to exceed five flagpoles) in front of sales offices to advertise the new development.

E. Political signs. No sign permit is required. Political signs or posters may be placed upon private property only and shall not be larger than ten square feet of sign area and shall not be posted or attached to telephone poles, power poles or other public utility facilities. Such signs must be removed seven days after the election in which the candidate or issue advertised on a sign has been determined. For a successful candidate in a primary election the sign may remain until the final election, but shall be removed within seven days after the election. The candidate or committee for which the sign is displayed shall be responsible for its removal and/or is subject to the penalties as provided in this code.

F. Community Banners or Cloth Signs. Such signs may be permitted and extend across a public street by permission of the city manager or appointed representative. Such signs may only be placed at city designated locations and erected by city personnel.

G. Banners. Such signs may be permitted on private property. Banners may be used to advertise a sale, other special events, or for new businesses waiting for a permanent sign. Notification to the city is required prior to hanging the banner. This notification shall include acknowledgement of the banner requirements, the dates the banner will be used and location of the banner. Businesses are only allowed one banner per wall with a maximum of two banners per business at any one time. All banners must comply with the following:

1. Maintenance standards. All banners must be legible, made of durable materials, and must be well maintained.

2. Time limitation. Banners are limited to two, thirty-day placements per calendar year.

3. Location on property. Banners must be located completely on a wall, and tacked down on four corners. Banner size shall be regulated to a maximum of 10 percent of the architectural elevation per wall.

H. Sandwich Board Signs. Only businesses that cater to pedestrians such as: restaurants, retail businesses that sell clothing, gifts, accessories, small markets, or other similar uses as determined by the Director of Community Development shall be allowed to have sandwich board signs. Such signs shall only be pedestrian oriented in nature and businesses will only be allowed a maximum of one sandwich board sign. These signs are subject to the following conditions:

1. Notification. Notification to the city is required prior to displaying a sandwich board sign. This notification shall include acknowledgement of the sandwich board sign requirements, list of materials used, and rendering of the sign, including the dimensions. Liability for all sandwich board signs placed in the right-of-way is that of the business placing the sign.

2. Size. The area of the sign shall not exceed 9 square feet per side in size and shall not be wider than 3 feet.

3. Maintenance Standards. Signs shall be constructed out of materials able to withstand typical northwest weather. Such materials may be metal, finished wood, chalkboard, whiteboard or plastic; signs and copy shall be of professional quality. Owners of sandwich board signs shall be required to keep their signs in a legible, intact, and well maintained manner.

4. Display Time. Signs may only be displayed during business hours. If business hours continue past daylight hours, precautions should be taken to place the sign in a location where it is readily visible after dark. This shall not be construed to allow the wiring of a sign for lighting.

5. Location. Signs may be located no further than 12 feet from the entrance to the business. Such signs shall not be placed in a location which is within the vision triangle or any location which will impede vehicular traffic. Further, such signs shall not be placed in a manner which will block or otherwise obstruct the safe use of sidewalks, building entrances or stairs by pedestrians, including pedestrians who are visually impaired or otherwise handicapped.

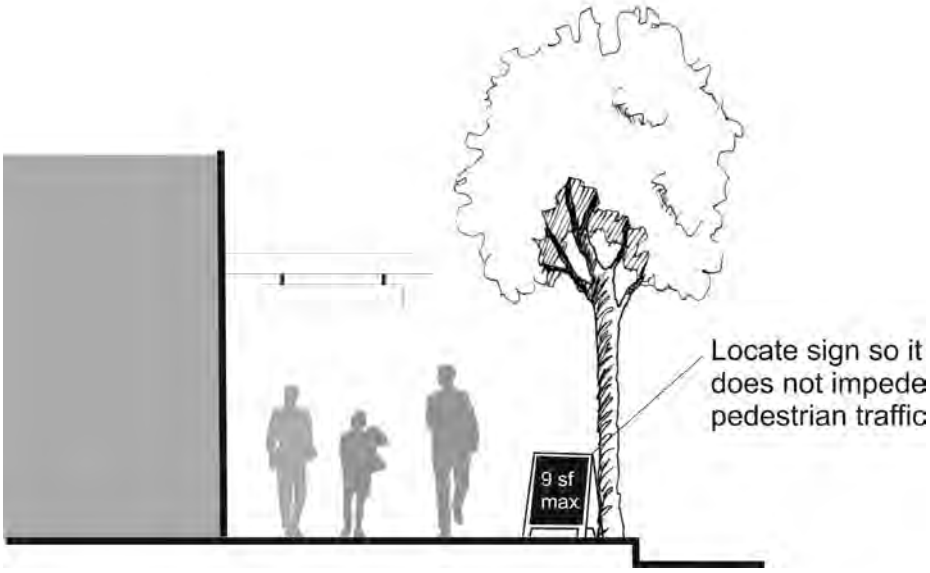


Figure 16.75.100(H-1).Sandwich board sign standards.

Exception. For multi-tenant centers where most businesses are located more than 12 feet from the public ROW, center owners or their representatives may apply for a permit to depart from this standard, provided the following provisions are met:

a. A maximum of one sign per 100 feet of ROW frontage;

b. Signs may be placed in the public ROW on one side of sidewalk in a manner that allows a minimum of 5 feet of horizontal clearance for pedestrians.

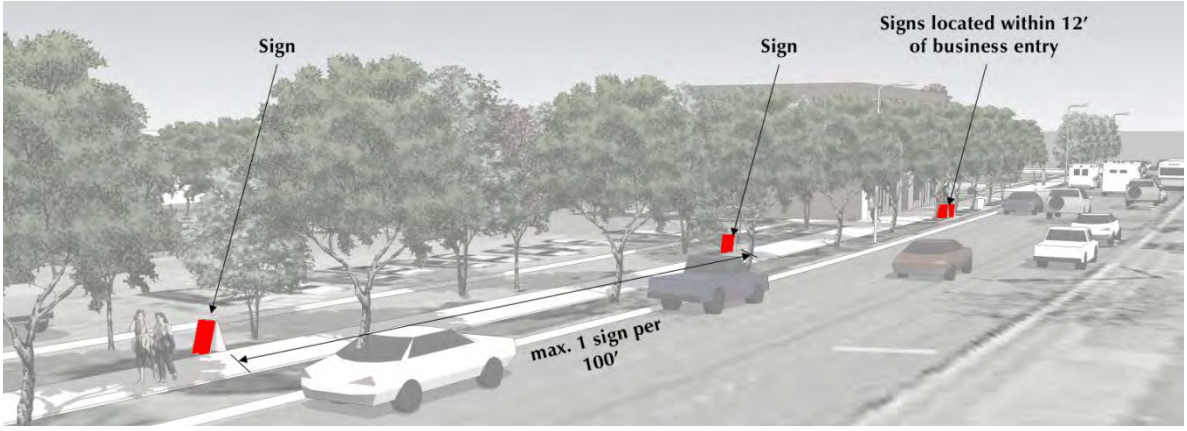


Figure 16.75.100(H-2). Illustrating sandwich board sign provisions. The first two sign on the left are more than 12 feet from their respective business entries, but allowed per the exception provision above. The cluster of sandwich board signs in the distance to the right are all within 12 feet of their respective business entries.

I. Feather Signs. Feather signs are prohibited except where used for a Grand Opening Event and/or Business Sales Event [LMC 16.75.080(B) and (C)(2)] or by permit for multi-tenant centers meeting the criteria below.

a. Applicants. Multi-tenant center owners or their representatives.

Number of signs permitted. A maximum of one sign per 100 feet of ROW frontage;

b. Location of signs. Signs may be placed outside the public ROW on the back side of the sidewalk, as shown in Figure 16.75.100(I).

c. Maximum height of signs. 13 feet.

d. The use of consistent size and shape of feather signs are encouraged where more than one sign is permitted.

Figure 16.75.100(I). Where permitted for multi-tenant centers, feather signs shall be placed at intervals of no more than 1 sign per 100 lineal feet of frontage and located behind the sidewalk.

J. Garage sale (yard sales, moving sales, patio sales). No sign permit is required. Such sign shall be limited to one sign on the premises and three off-premises signs. No such sign shall exceed four square feet in sign area. The sign or signs may be displayed only during the sale and must be removed the day the sale ends. The person or persons for which the sign or signs are displayed shall be responsible for its removal and/or is subject to the penalties as provided in this code.

K. Seasonal sales. No sign permit is required. Vendors who receive a temporary business license as defined in LMC 5.12.050 for seasonal or temporary sales activities (e.g. Christmas trees) are permitted one sign not to exceed 20 square feet in sign area. This sign shall be mounted to the booth or trailer used for temporary sales.

16.75.110 Legal Non-Conforming Signs.

Legal nonconforming signs may remain in use only under the following conditions:

A. No such sign shall be changed in any manner that increases the noncompliance of such sign with the provision of ordinance codified in this chapter established for signs in the district in which the sign is located.

B. The burden of establishing a sign to be legally nonconforming under this section rests upon the person or persons, firm or corporation claiming legal status for a sign.

C. When a sign is structurally altered, it ceases to be a legal nonconforming sign and must conform with the provisions of this chapter. Structural alteration means any action that changes the height, size, or shape of the sign or any action that affects the base or support(s) of the sign.

D. When a business or activity containing a legal nonconforming sign is enlarged or remodeled to a value of fifty percent or more of existing value of real property improvements, then such sign must be brought into conformity with this chapter.

E. When a business or activity containing a legal nonconforming sign changes the type of the business, then such sign must be brought into conformance with this chapter.

F. Violations. Any violation of this chapter shall terminate immediately the right to maintain a nonconforming sign.

16.75.120 Enforcement and Sign Removal.

A. Termination of illegal signs. The right to maintain any sign shall terminate and shall cease to exist whenever the sign is:

   1. Abandoned. No persons shall maintain or permit to be maintained on any premises owned or controlled by such persons any sign which has been abandoned.

   2. Damaged or destroyed beyond fifty percent. The determination whether a sign is damaged or destroyed beyond fifty percent shall rest with the code administrator and shall be based upon the actual cost of replacing said sign; and/or

   3. Structurally substandard under any applicable ordinance of the city to the extent that the sign becomes a hazard or a danger.

B. Removal of unlawful signs.

   1. Any unlawful permanent type sign which has not been removed within thirty days after conviction of violation or imposition of civil penalty may be removed by the city and the costs charged to the violator. If removal costs have not been paid and the sign reclaimed within thirty days of its removal by the city, the city may sell or otherwise dispose of the sign and apply the proceeds toward costs of removal. Any proceeds in excess of costs of removal shall be paid to the owner of the sign.

   2. Signs which the City finds upon public streets, sidewalks, right-of-way or other public property or which wherever located present an immediate and serious danger to the public because of their unsafe condition may be immediately removed without prior notice.

3. Any unlawful temporary or portable type sign located on private property which has not been removed after twenty-four hours from notification may be removed by the city. The sign may be reclaimed by the owner after a civil penalty of $100 has been paid. If the sign has not been reclaimed within thirty days of its removal by the city, the city may sell or otherwise dispose of the sign and apply the proceeds toward costs of the removal. Any proceeds in excess of costs of the removal shall be paid to the owner of the sign.

4. Neither the city nor any of its agents shall be liable for any damage to the sign when removed under this section.

C. Violation--Penalty.

1. Violation of the provisions of this code or failure to comply with any of its requirements shall constitute a misdemeanor and such violation shall be punished as provided by the statutes of the state of Washington for the commission of a misdemeanor. Each day such violation continues shall be considered a separate offense.

2. The erector, owner or user of an unlawful sign or the owner of the property on which an unlawful sign is located and who maintains such violation may each be found guilty of a separate offense and suffer the penalties herein provided.

16.75.130 Severability.

A. If any Section, sentence, clause, phrase, word, portion, or provision of this chapter is held invalid or unconstitutional by any court of competent jurisdiction, such decision shall not affect, impair, or invalidate any other Section, sentence, clause, phrase, word, portion, or provision of this chapter which can be given effect without the invalid provision.

B. The invalidation of the application of any Section, sentence, clause, phrase, word, portion, or provision of this chapter to a particular property or structure, or any particular properties or structures, by any court of competent jurisdiction shall not affect the application of such Section, sentence, clause, phrase, word, portion or provision to any other property or structure not specifically included in said invalidation.

MINUTES
Lacey Planning Commission Meeting
Tuesday, December 2, 2014 – 7:00 p.m.
Lacey City Hall Council Chambers, 420 College Street SE

Meeting was called to order at 7:00 p.m. by Gail Madden.

Planning Commission members present: Gail Madden, Mike Beehler, Carolyn Cox, Paul Enns, Albert de Santis, and Carolyn St. Claire. Staff present: Ryan Andrews, Rick Walk, Christy Osborn, Brandon McAllister, Teri O'Neal, and Leah Bender.

Gail Madden noted a quorum present.

Paul Enns made a motion, seconded by Carolyn St. Claire, to approve the agenda for tonight's meeting. The motion carried. Carolyn Cox made a motion, seconded by Carolyn St. Claire, to approve the November 18, 2014, meeting minutes. The motion carried.

1. **Public Comments:** None.

2. **Commission Member's Report:** None.

3. **Director's Report:**
   - Rick Walk noted that the HVAC system is being updated during tonight's meeting.
   - Rick informed Planning Commission that the street tree ordinance will go before Council for a work session on January 15, 2015.
   - Rick noted that so far we have received six applications for the vacant Planning Commission position. Interviews will be set up in January.

4. **Public Hearing:**
   Wetland Buffer Rating System Revisions:
   - Christy Osborn explained that Department of Ecology has updated the state wetland ratings system, which requires the City of Lacey to update the wetland chapter of the Critical Areas Ordinance and amend the Shoreline Master Program.
   - Christy went over the changes and clarifications that were made.
   - Christy stated that the Land Use Committee reviewed the draft and made no changes. The Committee suggested that staff contact Olympia Master Builders to allow them an opportunity to comment. Christy forwarded the draft to OMB, they had no comment.
   - Christy noted that she received an email from Carolyn Cox expressing concern about the in lieu fee. Christy explained that the section only allows the City to set up an in lieu program and the establishment of any program would require a separate public process.
   - Carolyn Cox thanked staff for considering her comments and for clarifying the section. She stressed the importance of getting it right and noted that other jurisdictions have not done so and had problems arise later as a result.
   - Carolyn St. Claire asked about the removal of the state manual and asked if the City complies with Federal or State. Christy explained that the State manual was done away with and the amended chapter makes it clear that we comply with the Federal manual, as has been done for several years.
   - No public testimony was given.
   - **Mike Beehler made a motion, seconded by Carolyn Cox, to recommend the amendments to Council for adoption. All were in favor. The motion carried.**

5. **Old Business:**
   Wastewater Comprehensive Plan:
   - Ryan Andrews explained that a public hearing was held on November 4. The City received written comments from Bill Lynn, and Bob Patrick addressed Planning Commission, expressing the concerns of property owners in the area around 15th Avenue NE related to the extension of sewer to the area. The property owners were concerned that installing gravity sewer and lift station in the area would be cost prohibitive for future potential development. Planning Commission agreed to wait one month before making a recommendation to Council.
   - Brandon McAllister gave a summary of staff analysis and noted that the Wastewater Comp Plan is intended to be a planning tool and does not attempt to address sewer system design issues on a project specific level.

- Brandon noted that property owners of some existing developments have been allowed to use STEP or grinder pump systems as part of a previous agreement with the City and because of immediate public health concerns for properties adjacent to Woodland Creek.
- Staff has determined that based on the topography and zoning for the area, the best option is a gravity/pump station sewer collection system.
- Bill Lynn addressed Planning Commission. He represents 3's Company LLC and Caliber, and he and his clients appreciate that they were given more time, and hope that Planning Commission will consider their concerns. He explained that this project would be very cost prohibitive and very detrimental to his clients. Sewer connection costs would be so high that it would tie up projects for years. Mr. Lynn noted that latecomers and LID are not good options.
- Steve Hatton addressed Planning Commission. He noted that he had a client who owned property in that area. He suggested that the Comp Plan identify STEP as the preferred sewerage method because the previous client's properties have been divided into various ownerships and makes a gravity system less financially feasible because the capital costs would be borne by individual owners rather than just one larger ownership.
- Chris Cramer with Patrick Harron addressed Planning Commission. He explained that the cost for connections per lot would be estimated at $10,000 per lot and that it would make the cost so high that it would not be feasible to develop if the area developed out at the minimum density. He estimated that the cost of either STEP or grinder system would be estimated at about half of that cost.
- Ryan stated that even though the initial installation cost for STEP/grinder may be less expensive, the long term operations and maintenance cost would be higher and would be paid by the City through utility rates.
- Carolyn St. Claire pointed out that it is a fact of life that undeveloped areas will eventually be developed. She said Planning Commission should support the decision staff has made.
- Mike Beehler noted that the issues are beyond the scope of Planning Commission's knowledge and may not be appropriate for them to decide.
- Teri O'Neal reiterated that the Wastewater Comp Plan is a planning tool and not intended to address specific projects and the reason this is being considered is because of the comment letter we received. The Plan does not address this specific area in question nor does it address what type of system is appropriate.
- **Carolyn St. Claire made a motion, seconded by Mike Beehler, to recommend the Wastewater Comp Plan to Council. All were in favor. The motion carried.**
- Ryan pointed out that the Plan will go before Council in July along with other Comp Plan updates.

Sign Ordinance Update:

- Ryan Andrews noted that a public hearing was held on November 18. Planning Commission decided to give further consideration to the comment letter from the Wig Property Group. Ryan went through the draft ordinance and discussed changes that were made at the request of Wig Properties and Planning Commission.
- Rick noted that it has been suggested that the City develop, in conjunction with the Lacey Chamber and local businesses, a best practices document to have available at the front counter to aid business owners by discussing the challenges regarding the permit process, signage, location, etc.
- Carolyn St. Claire said the new ordinance is much better than the old one.
- Gail Madden commended Ryan for all the work he's done on the ordinance.
- Ryan noted that the Sign Ordinance Committee and the consultant did a great job.
- **Paul Enns made a motion, seconded by Carolyn Cox, to forward the Sign Ordinance to Council. All were in favor. The motion carried.**
- Carolyn Cox said Ryan did a great job addressing the Wig Property comments.

6. **Communications and Announcements:** Ryan informed Planning Commission that Peter Brooks will give a presentation regarding sewer and the Septic Summit in the near future.

7. **Next meeting:** December 16, 2014.

8. **Adjournment:** 8:50 p.m.

Staff Analysis of Comments Provided by
Wig Properties LLC & Craig Realty Group
November 14, 2014

a. Under 16.75.050 Prohibited Signs, part A Sign Location restrictions, item 6, we request that you modify this item to say "Any commercial, advertising, or business sign that is not in keeping with the character, use and nature of the center, surrounding businesses, development projects, business centers, or associations located within the jurisdiction of, or to support economic development activities within the City of Lacey." Alternatively, we request that there is a carve-out for large shopping centers or large sized master planned properties where signage may need to be on a separate premises from the business to which it refers in order to institute an effective comprehensive master sign program.

Staff analysis: This refers to the section specifically prohibiting off premises signs. Specific to the Wig property, off-premises signs within the City jurisdiction would not benefit them. The purpose of the off-premise signage would be to provide advance warning to travelers on I-5 to take the appropriate exit to visit a future planned regional shopping center. An on-site freeway oriented sign can be place on their property to give enough notice to motorist travelling north bound to take exit 111. The greatest need to provide direction to motorist the in advance of exit 111 is for southbound travelers. This is because the property is located west of exit 111 and motorists cannot see the center in time to take the exit 111 southbound off ramp. Properties east of exit 111 would be the likely locations for off-premises signage. However, the properties east of the exit 111 interchange are in the unincorporated urban growth area and would be subject to the regulations of Thurston County and not the City of Lacey. The WSDOT informational signage program and the City's wayfinding signage program will benefit this property and will direct the travelling public from Interstate 5 to the property and would ultimately be more effective than locating any private off-premises signage. Staff recommends keeping the language as proposed in the public hearing draft of the regulations.

b. Under 16.75.050, part B, item 2, we request that Digital Signs be excluded from items 2(b), 2(e), 2(f), and 2(g) for clarification purposes and to provide consistency across the sign code.

The signage committee purposely did not want digital signage to be moving or otherwise animated to prevent driver distraction and clutter issues. Section (a) of this section confirms that no digital sign except for those associated with freestanding signs per LMC 16.75.080(A)(7) be allowed. Staff recommends keeping the language as proposed in the public hearing draft.

Under 16.75.080 Sign Type Standards, A Freestanding Signs:

c. Part 3 Permitted Number of Signs, we request 2 signs be permitted flanking each driveway entrance, per property that exceeds 500' of frontage. We believe that flanking signs would provide exposure for additional tenants and would add architectural prominence to each entrance, which provides the first impression to customers when they enter a site.

Whereas the committee agreed that opportunities for some additional signage along large frontages are warranted and reflected in the proposed code update, there was no discussion on allowing two signs at each driveway entrance. Such additional signage may not meet the overall goal of regulations pertaining to the reduction of clutter. With the ability to have larger signage and more signage at regular spacing, there is more than ample signage and advertising opportunity. Staff recommends keeping the language as recommended by the sign committee.

d. Part 4 Materials and Design, item c, we would like to clarify that double sided signage is allowed.

Double-sided signage will continue to be allowed in Lacey and is reflected in the definition of "sign area" on page 7 of the proposed regulations. No changes to the proposed regulations are necessary.

e. Part 7 Digital Signage Integration, item i., we propose to clarify that freestanding freeway signs permit fading changes as we believe this is the least intrusive method of transitioning from slide to slide. We would like to avoid cutting from one slide to the next in order to avoid any harsh, abrupt, change of light level at night.

Wig Properties raise a good point, based on guidance from the Federal Highway Administration (see attached) 1-2 seconds of transition time is recommended. Based on the new perspective and FHWA recommendations, staff recommends the Planning Commission consider amending the proposed regulations to state that simple transitions with a maximum of two seconds of transition time are required.

f. Part 7 Digital Signage Integration, item ii., we request that "Daytime" and "Nighttime" be defined based on an astronomical clock that follows sunrise and sunset.

Staff agrees with this comment and recommends the Planning Commission amend the draft to reflect this suggestion.

g. Part 9 Freestanding signs for large shopping centers. We request and propose that multiple double-sided digital signs be permitted, at measured intervals along the frontage and freeway sides, similar to distances in table 16.75.080(A)(3). We also request that the signs be allowed without setbacks from the right of way.

The proposed regulations provide multiple opportunities to place signs at measured intervals along fronting streets in addition to a large shopping center sign. Therefore, no changes are being recommended for fronting streets. As for freeway-oriented signs, additional signs could be considered for properties that have a large amount of freeway frontage. Properties with a large amount of frontage could have multiple well-designed signs without creating a clutter issue, which was the concern of the sign committee. In order to have a freeway oriented sign, the property must have a minimum of 1,100 lineal feet of frontage. Based on the amount of freeway frontage, staff recommends that the Planning Commission consider amending the draft regulations so that one sign may be placed on the property for every 1,100 lineal feet of freeway frontage not to exceed three total signs on the individual shopping center.

h. Part 10 Freestanding signs for freeway-oriented businesses, item B. We request that signs be considered in proportion to the size of the property. We would like the height to be 70 feet and the size of the sign to be 1000 SF and to allow departures for digital signs under item B, ii.

The three sites where freeway oriented signs could be considered (South Sound Center, Martin Village, Gateway property) are unique in their configuration and signage needs. The signage committee reviewed each site in their recommendation and decided to keep the existing standards (not to exceed 30 feet in height or 300 feet of sign area) with the understanding that most sites will require a departure, and therefore, additional height and/or signage area based on site-specific conditions. The committee also reviewed similar jurisdictions around the area and found the height and sign area standards are consistent with the current proposal.

i. Part 10 Freestanding signs for freeway-oriented businesses, item C. We propose to exclude those businesses within the large shopping center, as permissible under state law. We also suggest that language be added to ensure the sign is fully enclosed architecturally with no exposed conduits or switchgear, and landscaping to screen any transformers.

Based on the submitted comments, staff is recommending eliminating section 10.c. which states that businesses that can advertise on freeway-oriented signs not be eligible for DOT information signs. Since businesses can be eligible to be on a DOT sign but there may not be space or other

reasons that would otherwise exclude them, staff is recommending eliminating this provision. Also, language stating that the sign be fully enclosed and any transformers be screened has been added.

Under 16.75.080 Sign Type Standards, B Wall Signs:

j. Item 2, Location and Design, part a. We suggest an 80% width limit on a single architectural plane.

The regulations require 2/3's of the tenant space width which helps break up and better define individual tenant spaces (see figure 16.75.080(B)(3-3) for an illustration of this). The sign committee discussed this provision at length and reviewed various photo examples. The conclusion was that it is important to keep a level of definition between the tenant spaces and determined that 2/3's was a good threshold. Based on this, staff recommends keeping the 2/3's requirement.

k. Item 3, Maximum size – individual retailers. We request that the maximum sign amount for a wall, canopy or awning signage not exceed 1.5 square feet area per lineal foot of frontage. This helps simplify the calculations for what sign size is permissible and helps provide clarity to potential tenants (and avoids the need to calculate sign surface area which is more complicated as the surface area will be changing throughout various facades on the center).

The maximum size for wall signage is in keeping with the way the city currently calculates wall sign sizes. The table that regulates maximum sign size based on the architectural area of the wall (LMC 16.75.080.B.3.) has been simplified from the version in the current sign code. For purposes of consistency with how the City and consultant have traditionally calculated wall signage, staff is recommending to retain the proposed table.

Under 16.75.080 Sign Type Standards, D Projecting Signs:

l. Item 2 Sign Area, part a, ii., we propose to space the façade 8" to 12" clear with a sign width of 42 inches.

m. Item 2 Sign Area, part b, i., we propose that the horizontal oriented signs be proportional to the façade, with a maximum size of 60" x 60".

The purpose of the dimensional requirements in the draft is for a tenant to take advantage of the use of projecting signs, but also their use as an architectural feature. Making projecting signs overly large will detract from their use as an architectural feature. The proposed draft also is very generous when it comes to the amount of wall signage that can be used. Staff recommends a minor modification for a greater projection on vertical oriented signs from 3' to 42" on single story facades and up to 5' projection on upper story facades to stay in proportion and allow extra room for sign separation from the building. Staff recommends keeping the draft language for horizontally-oriented signs as originally proposed.

Under 16.75.080 Sign Type Standards, E Under Canopy Signs:

n. Item 3, our under canopy signs are usually much larger. We request that under canopy signs shall not exceed 42" in height.

Increasing the height of under canopy signs also correlates with raising the canopy associated with the front of the building. Most commercial centers maintain a 10' canopy height at the front of the building. Staff recommends keeping the sign height at 2' to encourage pedestrian-scaled canopy heights.

Under 16.75.080 Sign Type Standards, H Sandwich Board Signs:

o. Item 2 Size. We request that the area of the sign shall not exceed 9 square feet per side in height and shall not be wider than 36".

Standards across the signage industry for sandwich board signs are for 2’ x 3’ signs. Having a slightly larger sign would be acceptable provided that the regulations for sidewalk clearance are followed. Staff recommends the Planning Commission consider 3’ x 3’ sandwich board signs.

D.K. BOOS GLASS, INC.

AUTO • RESIDENTIAL • COMMERCIAL
1206 Franz St. Lacey, Washington 98503
(360) 456-0668
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Cont. Lic. DKBOOGI160NG

November 18, 2014

City of Lacey Community Development
420 College Street SE
Lacey, WA 98503

RE: Wall Sign Regulations

Dear Planning Commission,

I am writing today in request for more leniencies in regards to our wall sign. When we got the approval from City of Lacey for our sign Pacific Avenue was a two way street going East and West. As you are aware Pacific Avenue has since changed to a one way. We would like to relocate our sign to the rear of our building so that it would make it easier for drivers to read it and it would be safer, because they can read it as they approach the traffic signal without turning their heads to the side.
In addition some time down the road I would like the flexibility to replace the existing sign with a more modern version.
Thank you for considering my request. I look forward to hearing from you.

Sincerely,

Eric Boos

Eric Boos
Vice President
D.K. Boos Glass, Inc.

MINUTES
Lacey Planning Commission Meeting
Tuesday, November 18, 2014 – 7:00 p.m.
Lacey City Hall Council Chambers, 420 College Street SE

Meeting was called to order at 7:00 p.m. by Gail Madden.

Planning Commission members present: Gail Madden, Mike Beehler, Carolyn Cox, Paul Enns, Cathy Murcia, and Rebecca Lee. Staff present: Ryan Andrews, Rick Walk, Christy Osborn, and Leah Bender.

Gail Madden noted a quorum present.

Carolyn Cox made a motion, seconded by Cathy Murcia, to approve the agenda for tonight's meeting. The motion carried. Mike Beehler made a motion, seconded by Paul Enns, to approve the November 4, 2014, meeting minutes. The motion carried.

1. **Public Comments:** None.

2. **Commission Member's Report:** None.

3. **Director's Report:**
   - Rick Walk reported that at the last Council meeting, Council acted on the multi-family tax exemption issue and that there will be a hearing on December 18.
   - Rick reminded Planning Commission that the Washington Transportation Committee meeting is tomorrow and will cover the I-5 JBLM corridor.
   - Rick said the city is still recruiting for the Planning Commission vacancy.

4. **Public Hearing:**
   Sign Ordinance Update:
   - Ryan Andrews gave a PowerPoint presentation that outlined the process the ordinance update has gone through.
   - Ryan shared written comments that were submitted by DK Boos and Wig Properties. Ryan explained that DK Boos asked that they be allowed to move their sign. They currently have a vested non-conforming digital wall sign and if they alter it they will be required to bring the sign into compliance with the current sign regulations. The amended ordinance still does not allow digital wall signs, but there are other options available.
   - Rick discussed the Wig Properties comments and noted a couple of typos.
   - Connie Woodward, owner of Claws and Paws, addressed Planning Commission. She said that the current sign ordinance limits her options for advertising and is causing her business to lose money. She asked that the Planning Commission keep the needs of businesses in mind when they act on the new ordinance.
   - No other public testimony was given.
   - Rick said Planning Commission's options are to recommend the ordinance to Council, or discuss the testimony and written comments and make a recommendation at another time.
   - A suggestion was made to remove any gender specific language, and to change the wording in the sections regarding temporary signs that the responsible person must remove the sign <u>and</u> be subject to penalties to <u>or</u>.
   - Planning Commission and staff discussed the Wig Properties comments regarding digital signage, double-sided signs, freeway signs, and the definitions of "daytime" and "night time."
   - There was a discussion about the research that has been done on how digital signs cause distractions. Staff explained that a study was done on sign distractions but not specifically related to animated signs or digital fading.
   - There was a question as to whether or not the new ordinance will meet the needs of business such as Claws and Paws. Ryan explained that the new ordinance came about because of those needs and the goal of the update is to allow more flexibility.
   - Councilman Lenny Greenstein addressed Planning Commission and noted that although the new ordinance allows more, that doesn't necessarily mean that property owners and landlords will make changes to their current signs to benefit their tenants.

- There was a discussion about the amount of staff time that will be required for Departures. Ryan explained that that remains to be seen as this is a new process. It will be similar to small land use decisions and should be a fairly smooth process.
- It was suggested that staff review the comments and make a recommendation to Planning Commission at a later worksession.

5. **New Business:**
   Wetland Buffer Rating System Revision:
   - Christy Osborn explained that the Washington State Department of Ecology updated the state wetland rating system, which requires the City to update the wetland chapter of the Critical Areas Ordinance and complete a limited amendment of the Shoreline Master Program (SMP). The updates will become effective January 1, 2015.
   - Christy went over the changes to the wetlands protection chapter and distributed a new version of the SMP amendment.
   - There was a discussion about the in-lieu fees. Christy explained that it is an alternative option offered to people so they can meet their mitigation requirements at an off-site location when it is not possible to do so on-site.
   - The next step will be taking the updates to the Land Use Committee on December 1, and then a public hearing on December 2, 2014.

6. **Communications and Announcements:** None.

7. **Next meeting:** December 2, 2014.

8. **Adjournment:** 8:40 p.m.

DRIVER VISUAL BEHAVIOR IN THE PRESENCE OF COMMERCIAL ELECTRONIC VARIABLE MESSAGE SIGNS (CEVMS)

SEPTEMBER 2012

U.S. Department of Transportation
Federal Highway Administration

FHWA-HEP-

FOREWORD

The advent of electronic billboard technologies, in particular the digital Light-Emitting Diode (LED) billboard, has necessitated a reevaluation of current legislation and regulation for controlling outdoor advertising. In this case, one of the concerns is possible driver distraction. In the context of the present report, outdoor advertising signs employing this new advertising technology are referred to as Commercial Electronic Variable Message Signs (CEVMS). They are also commonly referred to as Digital Billboards and Electronic Billboards.

The present report documents the results of a study conducted to investigate the effects of CEVMS used for outdoor advertising on driver visual behavior in a roadway driving environment. The report consists of a brief review of the relevant published literature related to billboards and visual distraction, the rationale for the Federal Highway Administration research study, the methods by which the study was conducted, and the results of the study, which used an eye tracking system to measure driver glances while driving on roadways in the presence of CEVMS, standard billboards, and other roadside elements. The report should be of interest to highway engineers, traffic engineers, highway safety specialists, the outdoor advertising industry, environmental advocates, Federal policymakers, and State and local regulators of outdoor advertising.

Monique R. Evans
Director, Office of Safety
Research and Development

Nelson Castellanos
Director, Office of Real Estate
Services

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TECHNICAL DOCUMENTATION PAGE

1. Report No. FHWA-HRT-	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Driver Visual Behavior in the Presence of Commercial Electronic Variable Message Signs (CEVMS)		5. Report Date 6. Performing Organization Code
7. Author(s) William A. Perez, Mary Anne Bertola, Jason F. Kennedy, and John A. Molino		8. Performing Organization Report No.
9. Performing Organization Name and Address SAIC 6300 Georgetown Pike McLean, VA 22101		10. Work Unit No. (TRAIS) 11. Contract or Grant No.
12. Sponsoring Agency Name and Address Office of Real Estate Services Federal Highway Administration 1200 New Jersey Avenue SE Washington, DC 20590		13. Type of Report and Period Covered 14. Sponsoring Agency Code
15. Supplementary Notes The Contracting Officer's Technical Representatives (COTR) were Christopher Monk and Thomas Granda.		

16. Abstract

This study was conducted to investigate the effect of CEVMS on driver visual behavior in a roadway driving environment. An instrumented vehicle with an eye tracking system was used. Roads containing CEVMS, standard billboards, and control areas with no off-premise advertising were selected. Data were collected on arterials and freeways in the day and nighttime. Field studies were conducted in two cities where the same methodology was used but there were differences in the roadway visual environment. The gazes to the road ahead were high across the conditions; however, the CEVMS and billboard conditions resulted in a lower probability of gazes as compared to the control conditions (roadways not containing off-premise advertising) with the exception of arterials in Richmond where none of the conditions differed from each other. Examination of where drivers gazed in the CEVMS and standard billboard conditions showed that gazes away from the road ahead were not primarily to the billboards. Average and maximum fixations to CEVMS and standard billboards were similar across all conditions. However, four long dwell times were found (sequential and multiple fixations) that were greater than 2,000 ms. One was to a CEVMS on a freeway in the day time, two were to the same standard billboard on a freeway once in the day and once at night; and one was to a standard billboard on an arterial at night. In Richmond, the results showed that drivers gazed more at CEVMS than at standard billboards at night; however, in Reading the drivers were equally likely to gaze towards CEVMS or standard billboards in day and night. The results of the study are consistent with research and theory on the control of gaze behavior in natural environments. The demands of the driving task tend to affect the driver's self-regulation of gaze behavior.

17. Key Words Driver visual behavior, visual environment, billboards, eye tracking system, commercial electronic variable message signs, CEVMS, visual complexity		18. Distribution Statement No restrictions.	
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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
		NOTE: volumes greater than 1000 L shall be shown in m^3		
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
^oF	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	^oC
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
^oC	Celsius	1.8C+32	Fahrenheit	^oF
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.
(Revised March 2003)

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LIST OF ACRONYMS AND SYMBOLS

CEVMS	Commercial Electronic Variable Message Sign
EB	Empirical Bayes
DCZ	Data Collection Zone
ROI	Region of Interest
LED	Light-Emitting Diode
IR	Infra-Red
CCD	Charge-Coupled Device
MAPPS	Multiple-Analysis of Psychophysical and Performance Signals
GEE	Generalized Estimating Equations
FHWA	Federal Highway Administration
DOT	Department of Transportation

EXECUTIVE SUMMARY

This study examines where drivers look when driving past commercial electronic variable message signs (CEVMS), standard billboards, or no off-premise advertising. The results and conclusions are presented in response to the three research questions listed below:

1. Do CEVMS attract drivers' attention away from the forward roadway and other driving-relevant stimuli?

2. Do glances to CEVMS occur that would suggest a decrease in safety?

3. Do drivers look at CEVMS more than at standard billboards?

This study follows a Federal Highway Administration (FHWA) review of the literature on the possible distracting and safety effects of off-premise advertising and CEVMS in particular. The review considered laboratory studies, driving simulator studies, field research vehicle studies, and crash studies. The published literature indicated that there was no consistent evidence showing a safety or distraction effect due to off-premise advertising. However, the review also enumerated potential limitations in the previous research that may have resulted in the finding of no distraction effects for off-premise advertising. The study team recommended that additional research be conducted using instrumented vehicle research methods with eye tracking technology.

The eyes are constantly moving and they fixate (focus on a specific object or area), perform saccades (eye movements to change the point of fixation), and engage in pursuit movements (track moving objects). It is during fixations that we take in detailed information about the environment. Eye tracking allows one to determine to what degree off-premise advertising may divert attention away from the forward roadway. A finding that areas containing CEVMS result in significantly more gazes to the billboards at a cost of not gazing toward the forward roadway would suggest a potential safety risk. In addition to measuring the degree to which CEVMS may distract from the forward roadway, an eye tracking device would allow an examination of the duration of fixations and dwell times (multiple sequential fixations) to CEVMS and standard billboards. Previous research conducted by the National Highway Traffic Safety Administration (NHTSA) led to the conclusion that taking your eyes off the road for 2 seconds or more presents a safety risk. Measuring fixations and dwell times to CEVMS and standard billboards would also allow a determination as to the degree to which these advertising signs lead to potentially unsafe gaze behavior.

Most of the literature concerning eye gaze behavior in dynamic environments suggests that task demands tend to override visual salience (an object that stands out because of its physical properties) in determining attention allocation. When extended to driving, it would be expected that visual attention will be directed toward task-relevant areas and objects (e.g., the roadway, other vehicles, speed limit signs) and that other salient objects, such as billboards, would not necessarily capture attention. However, driving is a somewhat automatic process and conditions generally do not require constant, undivided attention. As a result, salient stimuli, such as CEVMS, might capture driver attention and produce an unwanted increase in driver distraction. The present study addresses this concern.

This study used an instrumented vehicle with an eye tracking system to measure where drivers were looking when driving past CEVMS and standard billboards. The CEVMS and standard billboards were measured with respect to luminance, location, size, and other relevant variables to characterize these visual stimuli extensively. Unlike previous studies on digital billboards, the present study examined CEVMS as deployed in two United States cities. These billboards did not contain dynamic video or other dynamic elements, but changed content approximately every 8 to 10 seconds. The eye tracking system had nearly a 2-degree level of resolution that provided significantly more accuracy in determining what objects the drivers were looking at compared to an earlier naturalistic driving study. This study assessed two data collection efforts that employed the same methodology in two cities.

In each city, the study examined eye glance behavior to four CEVMS, two on arterials and two on freeways. There were an equal number of signs on the left and right side of the road for arterials and freeways. The standard billboards were selected for comparison with CEVMS such that one standard billboard environment matched as closely as possible that of each of the CEVMS. Two control locations were selected that did not contain off-premise advertising, one on an arterial and the other on a freeway. This resulted in 10 data collection zones in each city that were approximately 1,000 feet in length (the distance from the start of the data collection zone to the point that the CEVMS or standard billboard disappeared from the data collection video).

In Reading, Pennsylvania, 14 participants drove at night and 17 drove during the day. In Richmond, Virginia, 10 participants drove at night and 14 drove during the day. Calibration of the eye tracking system, practice drive, and the data collection drive took approximately 2 hours per participant to accomplish.

The following is a summary of the study results and conclusions presented in reference to the three research questions the study aimed to address.

Do CEVMS attract drivers' attention away from the forward roadway and other driving relevant stimuli?

- On average, the drivers in this study devoted between 73 and 85 percent of their visual attention to the road ahead for both CEVMS and standard billboards. This range is consistent with earlier field research studies. In the present study, the presence of CEVMS did not appear to be related to a decrease in looking toward the road ahead.

Do glances to CEVMS occur that would suggest a decrease in safety?

- The average fixation duration to CEVMS was 379 ms and to standard billboards it was 335 ms across the two cities. The average fixation durations to CEVMS and standard billboards were similar to the average fixation duration to the road ahead.

- The longest fixation to a CEVMS was 1,335 ms and to a standard billboard it was 1,284 ms. The current widely accepted threshold for durations of glances away from the road ahead that result in higher crash risk is 2,000 ms. This value comes from a NHTSA

naturalistic driving study that showed a significant increase in crash odds when glances away from the road ahead were 2,000 ms or longer.

- Four dwell times (aggregate of consecutive fixations to the same object) greater than 2,000 ms were observed across the two studies. Three were to standard billboards and one was to a CEVMS. The long dwell time to the CEVMS occurred in the daytime to a billboard viewable from a freeway. Review of the video data for these four long dwell times showed that the signs were not far from the forward view while participant's gaze dwelled on them. Therefore, the drivers still had access to information about what was in front of them through peripheral vision.

- The results did not provide evidence indicating that CEVMS, as deployed and tested in the two selected cities, were associated with unacceptably long glances away from the road. When dwell times longer than the currently accepted threshold of 2,000 ms occurred, the road ahead was still in the driver's field of view. This was the case for both CEVMS and standard billboards.

Do drivers look at CEVMS more than at standard billboards?

- When comparing the probability of a gaze at a CEVMS versus a standard billboard, the drivers in this study were generally more likely to gaze at CEVMS than at standard billboards. However, some variability occurred between the two locations and between the types of roadway (arterial or freeway).

- In Reading, when considering the proportion of time spent looking at billboards, the participants looked more often at CEVMS than at standard billboards when on arterials (63 percent to CEVMS and 37 percent to a standard billboard), whereas they looked more often at standard billboards when on freeways (33 percent to CEVMS and 67 percent to a standard billboard). In Richmond, the drivers looked at CEVMS more than standard billboards no matter the type of road they were on, but as in Reading, the preference for gazing at CEVMS was greater on arterials (68 percent to CEVMS and 32 percent to standard billboards) than on freeways (55 percent to CEVMS and 45 percent to standard billboards). When a gaze was to an off-premise advertising sign, the drivers were generally more likely to gaze at a CEVMS than at a standard billboard.

- In Richmond, the drivers showed a preference for gazing at CEVMS versus standard billboards at night, but in Reading the time of day did not affect gaze behavior. In Richmond, drivers gazed at CEVMS 71 percent and at standard billboards 29 percent at night. On the other hand, in the day the drivers gazed at CEVMS 52 percent and at standard billboards 48 percent.

- In Reading, the average gaze dwell time for CEVMS was 981 ms and for standard billboards it was 1,386 ms. The difference in these average dwell times was not statistically significant. In contrast, the average dwell times to CEVMS and standard billboards were significantly different in Richmond (1,096 ms and 674 ms, respectively).

The present data suggest that the drivers in this study directed the majority of their visual attention to areas of the roadway that were relevant to the task at hand (e.g., the driving task). Furthermore, it is possible, and likely, that in the time that the drivers looked away from the forward roadway, they may have elected to glance at other objects in the surrounding environment (in the absence of billboards) that were not relevant to the driving task. When billboards were present, the drivers in this study sometimes looked at them, but not such that overall attention to the forward roadway decreased.

It also should be noted that, like other studies in the available literature, this study adds to the knowledge base on the issues examined, but does not present definitive answers to the research questions investigated.

INTRODUCTION

"The primary responsibility of the driver is to operate a motor vehicle safely. The task of driving requires full attention and focus. Drivers should resist engaging in any activity that takes their eyes and attention off of the road for more than a couple of seconds. In some circumstances even a second or two can make all the difference in a driver being able to avoid a crash." – US Department of Transportation[1]

The advent of electronic billboard technologies, in particular the digital Light-Emitting Diode (LED) billboard, has prompted a reevaluation of regulations for controlling outdoor advertising. An attractive quality of these LED billboards, which are hereafter referred to as Commercial Electronic Variable Message Signs (CEVMS), is that advertisements can change almost instantly. Furthermore, outdoor advertising companies can make these changes from a central remote office. Of concern is whether or not CEVMS may attract drivers' attention away from the primary task (driving) in a way that compromises safety.

The current Federal Highway Administration (FHWA) guidance recommends that CEVMS should not change content more frequently than once every 8 seconds.[2] However, according to Scenic America, the basis of the safety concern is that the "…distinguishing trait…" of a CEVMS "… is that it can vary while a driver watches it, in a setting in which that variation is likely to attract the drivers' attention away from the roadway."[3]This study was conducted to provide the FHWA with data to determine if CEVMS capture visual attention differently than standard off-premise advertising billboards.

BACKGROUND

A 2009 review of the literature by Molino et al. for the FHWA failed to find convincing empirical evidence that CEVMS, as currently implemented, constitutes a safety risk greater than that of conventional vinyl billboards.[4] A great deal of work has been focused in this area, but the findings of these studies have been mixed.[4,5] A summary of the key past findings is presented here, but the reader is referred to Molino et al. for a comprehensive review of studies prior to 2008.[4]

Post-Hoc Crash Studies

Post-hoc crash studies use reviews of police traffic collision reports or statistical summaries of such reports in an effort to understand the causes of crashes that have taken place in the vicinity of some change to the roadside environment. In the present case, the change of concern is the introduction of CEVMS to the roadside or the replacement of conventional billboards with CEVMS.

The literature review conducted by Molino et al. did not find compelling evidence for a distraction effect attributable to CEVMS.[4] The authors concluded that all post-hoc crash studies are subject to certain weaknesses, most of which are difficult to overcome. For example, the vast majority of crashes are never reported to police; thus, such studies are likely to underreport crashes. Also, when crashes are caused by factors such as driver distraction or inattention, the involved driver may be unwilling or unable to report these factors to a police investigator.

Another weakness is that police, under time pressure, are rarely able to investigate the true root causes of crashes unless they involve serious injury, death, or extensive property damage. Furthermore, to have confidence in the results, such studies need to collect comparable data before and after the change, and, in the after phase, at equivalent but unaffected roadway sections. Since crashes are infrequent events, data collection needs to span extended periods of time both before and after introduction of the change. Few studies are able to obtain such extensive data.

Two recent studies by Tantala and Tantala examined the relationship between the presence of CEVMS and crash statistics in Richmond, Virginia, and Reading, Pennsylvania.[6,7] For the Richmond area, 7 years of crash data at 10 locations with CEVMS were included in the analyses. The study used a before-after methodology where most sites originally contained vinyl billboards (before) that were converted to CEVMS (after). The quantity of crash data was not the same for all locations and ranged from 1 year before/after to 3 years before/after. The study employed the Empirical Bayes (EB) method to analyze the data.[8] The results indicated that the total number of crashes observed was consistent with what would be statistically expected with or without the introduction of CEVMS. The analysis approach for Reading locations was much the same as for Richmond other than there were 20 rather than 10 CEVMS and 8 years of crash statistics. The EB method showed results for Reading that were very similar to those of Richmond.

The studies by Tantala and Tantala appear to address many of the concerns from Molino et al. regarding the weaknesses and issues associated with crash studies.[4,6,7] For example, they include crash comparisons for locations within multiple distances of each CEVMS to address concerns about the visual range used in previous analyses. They used EB analysis techniques to correct for regression-to-mean bias. Also, the EB method would better reflect crash rate changes due to changes in average daily traffic and the interactions of these with the roadway features that were coded in the model. The studies followed approaches that are commonly used in post-hoc crash studies, though the results would have been strengthened by including before-after results for non-CEVMS locations as a control group.

Field Investigations

Field investigations include unobtrusive observation, naturalistic driving studies, on-road instrumented vehicle investigations, test track experiments, driver interviews, surveys, and questionnaires. The following focuses on relevant studies that employed naturalistic driving and on-road instrumented vehicle research methods.

Lee, McElheny, and Gibbons undertook an on-road instrumented vehicle study on Interstate and local roads near Cleveland, Ohio.[9] The study looked at driver glance behavior in the vicinity of digital billboards, conventional billboards, comparison sites (sites with buildings and other signs, including digital signs), and control sites (those without similar signage). The results showed that there were no differences in the overall glance patterns (percent eyes-on-road and overall number of glances) between the different sites. Drivers also did not glance more frequently in the direction of digital billboards than in the direction of other event types (conventional billboards, comparison events, and baseline events) but drivers did take longer glances in the direction of digital billboards and comparison sites than in the direction of conventional billboards and baseline sites. However, the mean glance length toward the digital billboards was less than

1,000 ms. It is important to note that this study employed a video-based approach for examining drivers' visual behavior, which has an accuracy of no better than 20 degrees.[10] While this technique is likely to be effective in assessing gross eye movements and looks that are away from the road ahead, it may not have sufficient resolution to discriminate what specific object the driver is looking at outside of the vehicle.

Beijer, Smiley, and Eizenman evaluated driver glances toward four different types of roadside advertising signs on roads in the Toronto, Canada, area.[11] The four types of signs were: (a) billboard signs with static advertisements; (b) billboard advertisements placed on vertical rollers that could rotate to show one of three advertisements in succession; (c) scrolling text signs with a minor active component, which usually consisted of a small strip of lights that formed words scrolling across the screen or, in some cases, a larger area capable of displaying text but not video; and (d) signs with video images that had a color screen capable of displaying both moving text and moving images. The study employed an on-road instrumented vehicle with a head-mounted eye tracking device. The researchers found no significant differences in average glance duration or the maximum glance duration for the various sign types; however, the number of glances was significantly lower for billboard signs than for the roller bar, scrolling text, and video signs.

Smiley, Smahel, and Eizenman conducted a field driving study that employed an eye tracking system that recorded drivers' eye movements as participants drove past video signs located at three downtown intersections and along an urban expressway.[12] The study route included static billboards and video advertising. The results of the study showed that on average 76 percent of glances were to the road ahead. Glances at advertising, including static billboards and video signs, constituted 1.2 percent of total glances. The mean glance durations for advertising signs were between 500 ms and 750 ms, although there were a few glances of about 1,400 ms in duration. Video signs were not more likely than static commercial signs to be looked at when headways were short; in fact, the reverse was the case. Furthermore, the number of glances per individual video sign was small, and statistically significant differences in looking behavior were not found.

Kettwich, Kartsen, Klinger, and Lemmer conducted a field study where drivers' gaze behavior was measured with an eye tracking system.[13] Sixteen participants drove an 11.5 mile (18.5 km) route comprised of highways, arterial roads, main roads, and one-way streets in Karlsruhe, Germany. The route contained advertising pillars, event posters, company logos, and video screens. Mean gaze duration for the four types of advertising was computed for periods when the vehicle was in motion and when it was stopped. Gaze duration while driving for all types of advertisements was under 1,000 ms. On the other hand, while the vehicle was stopped, the mean gaze duration for video screen advertisements was 2,750 ms. The study showed a significant difference between gaze duration while driving and while stationary: gaze duration was affected by the task at hand. That is, drivers tended to gaze longer while the car was stopped and there were few driving task demands.

The previously mentioned studies estimated the duration of glances to advertising and computed mean values of less than 1,000 ms. Klauer et al., in his analysis of the 100-Car Naturalistic Driving Study, concluded that glances away from the roadway for any purpose lasting more than 2,000 ms increase near-crash/crash risk by at least two times that of normal, baseline driving.[14]

Klauer et al. also indicated that short, brief glances away from the forward roadway for the purpose of scanning the driving environment are safe and actually decrease near-crash/crash risk.[14] Using devices in a vehicle that draw visual attention away from the forward roadway for more than 2,000 ms (e.g., texting) is incompatible with safe driving. However, for external stimuli, especially those near the roadway, the evaluation of eye glances with respect to safety is less clear since peripheral vision would allow the driver to still have visual access to the forward roadway.

Laboratory Studies

Laboratory investigations related to roadway safety can be classified into several categories: driving simulations, non-driving-simulator laboratory testing, and focus groups. The review of relevant laboratory studies by Molino et al. did not show conclusive evidence regarding the distracting effects of CEVMS.[4] Moreover, the authors concluded that present driving simulators do not have sufficient visual dynamic range, image resolution, and contrast ratio capability to produce the compelling visual effect of a bright, photo-realistic LED-based CEVMS against a natural background scene. The following is a discussion of a driving simulator study conducted after the publication of Molino et al.[4] The study focused on the effects of advertising on driver visual behavior.

Chattington, Reed, Basacik, Flint, and Parkes conducted a driving simulator study in the United Kingdom (UK) to evaluate the effects of static and video advertising on driver glance behavior.[15] The researchers examined the effects of advertisement position relative to the road (left, right, center on an overhead gantry, and in all three locations simultaneously), type of advertisement (static or video), and exposure duration of the advertisement. (The paper does not provide these durations in terms of time or distance. The exposure duration had to do with the amount of time or distance that the sign would be visible to the driver.) For the advertisements presented on the left side of the road (recall that drivers travel in the left lane in the UK), mean glance durations for static and video advertisements were significantly longer (approximately 650 to 750 ms) when drivers experienced long advertisement exposure as opposed to medium and short exposures. Drivers looked more at video advertisements (about 2 percent on average of the total duration recorded) than at static advertisements (about 0.75 percent on average). In addition, the location of the advertisements had an effect on glance behavior. When advertisements were located in the center of the road or in all three positions simultaneously, the glance durations were about 1,000 ms and were significantly longer than for signs placed on the right or left side of the road. For advertisements placed on the left side of the road, there was a significant difference in glance duration between static (about 400 ms) and video (about 800 ms). Advertisement position also had an effect on the proportion of time that a driver spent looking at an advertisement. The percentage of time looking at advertisements was greatest when signs were placed in all three locations, followed by center location signs, then the left location signs, and finally the right location signs. Drivers looked more at the video advertisements relative to the static advertisements when they were placed in all three locations, placed on the left, and placed on the right side of the road. The center placement did not show a significant difference in percent of time spent looking between static and video.

Summary

The results from these key studies offer some insight into whether CEVMS pose a visual distraction threat. However, these same studies also reveal some inconsistent findings and potential methodological issues that are addressed in the current study. The studies conducted by Smiley et al. showed drivers glanced forward at the roadway about 76 percent of the time in the presence of video and dynamic signs where a few long glances of approximately 1,400 ms were observed.[12] However, the video and dynamic signs used in these studies portray moving objects that are not present in CEVMS as deployed in the United States. In another field study employing eye tracking, Kettwich et al. found that gaze duration while driving for all types of advertisements that they evaluated was less than 1,000 ms; however, when the vehicle was stopped, mean gaze duration for advertising was as high as 2,750 ms.[16] Collectively, these studies did not demonstrate that the advertising signs detracted from drivers' glances forward at the roadway in a substantive manner while the vehicle was moving.

In contrast, the simulator study by Chattington et al. demonstrated that dynamic signs showing moving video or other dynamic elements may draw attention away from the roadway.[15] Furthermore, the location of the advertising sign on the road is an important factor in drawing drivers' visual attention. Advertisements with moving video placed in the center of the roadway on an overhead gantry or in all three positions (right, left, and in the center) simultaneously are very likely to draw glances from drivers.

Finally, in a study that examined CEVMS as deployed in the United States, Lee et al. did not show any significant effects of CEVMS on driver glance behavior.[9] However, the methodology that was used likely did not employ sufficient sensitivity to determine at what specific object in the environment a driver was looking.

None of these studies combined all necessary factors to address the current CEVMS situation in the United States. Those studies that used eye tracking on real roads had animated and video-based signs, which are not reflective of current off-premise CEVMS practice in the United States.

STUDY APPROACH

Based on an extensive review of the literature, Molino et al. concluded that the most effective method to use in an evaluation of the effects of CEVMS on driver visual behavior was the instrumented field vehicle method that incorporated an eye tracking system.[4] The present study employed such an instrumented field vehicle with an eye tracking system and examined the degree to which CEVMS attract drivers' attention away from the forward roadway.

The following presents a brief overview and discussion of studies using eye tracking methodology with complex visual stimuli, especially in natural environments (walking, driving, etc.). The review by Molino et al. recommended the use of this type of technology and method; however, a discussion laying out technical and theoretical issues underlying the use of eye tracking methods was not presented.[4] This background is important for the interpretation of the results of the studies conducted here.

Standard and digital billboards are often salient stimuli in the driving environment, which may make them conspicuous. Cole and Hughes define attention conspicuity as the extent to which a stimulus is sufficiently prominent in the driving environment to capture attention. Further, Cole and Hughes state that attention conspicuity is a function of size, color, brightness, contrast relative to surroundings, and dynamic components such as movement and change.[17] It is clear that under certain circumstances image salience or conspicuity can provide a good explanation of how humans orient their attention.

At any given moment a large number of stimuli reach our senses, but only a limited number of them are selected for further processing. In general, attention can be focused on a stimulus because it is important for achieving some goal, or because the properties of the stimulus can attract the attention of the observer independent of their intentions (e.g., a car horn may elicit an orienting response). When the focus of attention is goal directed, it is referred to as top-down. When the focus of attention is principally a function of stimulus attributes, it is referred to as bottom-up.[18]

In general, billboards (either standard or CEVMS) are not relevant to the driving task but are presumably designed to be salient stimuli in the environment where they may draw a driver's attention. The question is to what degree CEVMS draw a driver's attention away from driving-relevant stimuli (e.g., road ahead, mirrors, and speedometer) and is this different from a standard billboard? In his review of the literature Wachtel leads one to consider CEVMS as stimuli in the environment where attention to them would be drawn in a bottom-up manner; that is, the salience of the billboards would make them stand out relative to other stimuli in the environment and drivers would reflexively look at these signs.[19] Wachtel's conclusions were in reference to research by Theeuwees who employed simple letter stimulus arrays in a laboratory task.[20] Research using simple visual stimuli in a laboratory environment are very useful for testing different theories of perception, but often lack direct application to tasks such as driving. The following discusses research using complex visual stimuli and tasks that are more relevant to natural vision as experienced in the driving task.

A recent review of stimulus salience and eye guidance by Tatler et al. shows that most of the evidence for the capture of attention by the conspicuity of stimuli comes from research in which the stimulus is a simple visual search array or in which the target is uniquely defined by simple visual features.[21] In other words, these are laboratory studies that use letters, arrays of letters, or simple geometric patterns as the stimuli. Pure salience-based models are capable of predicting eye movement endpoint in simple displays, but are less successful for more complex scenes that contain task-relevant and task-irrelevant salient areas.[22,23]

Research by Henderson et al. using photographs of actual scenes showed that subjects looked at non-salient scene regions containing a search target and rarely looked at salient non-task-relevant regions of the scenes.[24] Salience of the stimulus alone was not a good predictor of where participants looked. Additional research by Henderson using photographs of real world scenes also showed that subjects fixated on regions of the pictures that provided task-relevant information rather than visually salient regions with no task-relevant information. However, Henderson acknowledges that static pictures have many shortcomings when used as surrogates for real environments.[25]

Land's review of eye movements in dynamic environments concluded that the eyes are proactive and typically seek out information required in the second before each new activity commences.[26] Specific tasks (e.g., driving) have characteristic but flexible patterns of eye movement that accompany them, and these patterns are similar between individuals. Land concluded that the eyes rarely visit objects that are irrelevant to the task, and the conspicuity of objects is less important than the objects' roles in the task. In a subsequent review of eye movement and natural behavior, Land concluded that in a task that requires fixation on a sequence of specific objects, the capture of gaze by irrelevant salient objects would, in general, be an obtrusive nuisance.[22]

The literature examining gaze control under natural behavior suggests that it is principally top-down driven, or intentional.[24,25,26,22,21,27] However, top-down processing does not explain all gaze control or eye movements. For example, imagine driving down a two-lane country road and a deer jumps into the road. It is most likely that you will attend and react to this deer. Unplanned or unexpected stimuli capture our attention as we engage in complex natural tasks. Research by Jovancevic-Misic and Hayhoe showed that human gaze patterns are sensitive to the probabilistic nature of the environment.[28] In this study, participants' eye movement behavior was observed while walking among other pedestrians. The other pedestrians were confederates and were either safe, risky, or rogue pedestrians. When the study began, the risky pedestrian took a collision course with the participant 50 percent of the time, and the rogue pedestrian always assumed a collision course as he approached the participant, whereas the safe pedestrian never took a collision course. Midway through the study the rogue and safe pedestrians exchanged roles but the risky pedestrian role remained the same. The participants were not informed about the behavior of the other pedestrians. Participants were asked to follow a circular path for several laps and to avoid other pedestrians. The study showed that the participants modified their gaze behavior in response to the change in the other pedestrians' behavior. Jovancevic-Misic concluded that participants learned new priorities for gaze allocation within a few encounters and looked both sooner and longer at potentially dangerous pedestrians.[28]

Gaze behavior in natural environments is affected by expectations that are derived through long-term learning. Using a virtual driving environment, Shinoda et al. asked participants to look for stop signs while driving an urban route.[29] Approximately 45 percent of the fixations fell in the general area of intersections during the simulated drive, and participants were more likely to detect stop signs placed near intersections than those placed in the middle of a block. Over time, drivers have learned that stop signs are more likely to appear near intersections and, as a result, drivers prioritize their allocation of gazes to these areas of the roadway.

The Tatler et al. review of the literature concludes that in natural vision, a consistent set of principles underlies eye guidance. These principles include relevance or reward potential, uncertainty about the state of the environment, and learned models of the environment.[21] Salience of environmental stimuli alone typically does not explain most eye gaze behavior in naturalistic environments.

In sum, most of the literature concerning eye gaze behavior in dynamic environments suggests that task demands tend to override visual salience in determining attention allocation. When extended to driving, it would be expected that visual attention will be directed toward task-relevant areas and objects (e.g., the roadway, other vehicles, speed limit signs, etc.) and other

salient objects, such as billboards, will not necessarily capture attention. However, driving is a somewhat automatic process and conditions generally do not require constant undivided attention. As a result, salient stimuli, such as CEVMS, might capture driver attention and provide an unwarranted increase in driver distraction. The present study addresses this concern.

Research Questions

The present research evaluated the effects of CEVMS on driver visual behavior under actual roadway conditions in the daytime and at night. Roads containing CEVMS, standard billboards, and areas not containing off-premise advertising were selected. The CEVMS and standard billboards were measured with respect to luminance, location, size, and other relevant visual characteristics. The present study examined CEVMS as deployed in two United States cities. Unlike previous studies, the signs did not contain dynamic video or other dynamic elements. In addition, the eye tracking system used in this study has approximately a 2-degree level of resolution. This provided significantly more accuracy in determining what objects the drivers were looking at than in previous on-road studies examining looking behavior (recall that Lee et al. used video recordings of drivers' faces that, at best, examined gross eye movements).[9]

Two studies are reported. Each study was conducted in a different city. The two studies employed the same methodology. The studies' primary research questions were:

1. Do CEVMS attract drivers' attention away from the forward roadway and other driving relevant stimuli?

2. Do glances to CEVMS occur that would suggest a decrease in safety?

3. Do drivers look at CEVMS more than at standard billboards?

EXPERIMENTAL APPROACH

The study used a field research vehicle equipped with a non-intrusive eye tracking system. The vehicle was a 2007 Jeep® Grand Cherokee Sport Utility Vehicle. The eye tracking system used (SmartEye® vehicle-mounted infrared (IR) eye-movement measuring system) is shown in figure 1.[30] The system consists of two IR light sources and three face cameras mounted on the dashboard of the vehicle. The cameras and light sources are small in size, and are not attached to the driver in any manner. The face cameras are synchronized to the IR light sources and are used to determine the head position and gaze direction of the driver.

Figure 1. Eye tracking system camera placement.

As a part of this eye tracking system, the vehicle was outfitted with a three-camera panoramic scene monitoring system for capturing the forward driving scene. The scene cameras were mounted on the roof of the vehicle directly above the driver's head position. The three cameras together provided an 80-degree wide by 40-degree high field of forward view. The scene cameras captured the forward view area available to the driver through the left side of the windshield and a portion of the right side of the windshield. The area visible to the driver through the rightmost area of the windshield was not captured by the scene cameras.

The vehicle was also outfitted with equipment to record GPS position, vehicle speed, and vehicle acceleration. The equipment also recorded events entered by an experimenter and synchronized those events with the eye tracking and vehicle data. The research vehicle is pictured in figure 2.

Figure 2. FHWA's field research vehicle.

EXPERIMENTAL DESIGN OVERVIEW

The approach entailed the use of the instrumented vehicle in which drivers navigated routes in cities that presented CEVMS and standard billboards as well as areas without off-premise advertising. The participants were instructed to drive the routes as they normally would. The drivers were not informed that the study was about outdoor advertising, but rather that it was about examining drivers' glance behavior as they followed route guidance directions.

Site Selection

More than 40 cities were evaluated in the selection of the test sites. Locations with CEVMS displays were identified using a variety of resources that included State department of transportation contacts, advertising company Web sites, and a popular geographic information system. A matrix was developed that listed the number of CEVMS in each city. For each site, the number of CEVMS along limited access and arterial roadways was determined.

One criterion for site selection was whether the location had practical routes that pass by a number of CEVMS as well as standard off-premise billboards and could be driven in about 30 minutes. Other considerations included access to vehicle maintenance personnel/facilities, proximity to research facilities, and ease of participant recruitment. Two cities were selected: Reading, and Richmond.

Table 1 presents the 16 cities that were included on the final list of potential study sites.

Table 1. Distribution of CEVMS by roadway classification for various cities.

State	*Area*	*Limited Access*	*Arterial*	*Other* [(1)]	*Total*
VA	Richmond	4	7	0	11
PA	Reading	7	11	0	18
VA	Roanoke	0	11	0	11
PA	Pittsburgh	0	0	15	15
TX	San Antonio	7	2	6	15
WI	Milwaukee	14	2	0	16
AZ	Phoenix	10	6	0	16
MN	St. Paul/Minneapolis	8	5	3	16
TN	Nashville	7	10	0	17
FL	Tampa-St. Petersburg	7	11	0	18
NM	Albuquerque	0	19	1	20
PA	Scranton-Wilkes Barre	7	14	1	22
OH	Columbus	1	22	0	23
GA	Atlanta	13	11	0	24
IL	Chicago	22	2	1	25
CA	Los Angeles	3	71	4	78

(1) Other includes roadways classified as both limited access and arterial or instances where the road classification was unknown. *Source:* www.lamar.com and www.clearchannel.com

In both test cities, the following independent variables were evaluated:

- **The type of advertising.** This included CEVMS, standard billboards, and no off-premise advertising. (It should be noted that in areas with no off-premise advertising, it was still possible to encounter on-premise advertising; e.g., for gas stations, restaurants, and other miscellaneous stores and shops.)

- **Time of day.** This included driving in the daytime and at night.

- **The functional class of roadways in which off-premise advertising signs were located.** Roads were classified as either freeway or arterial. It was observed that the different road classes were correlated with the presence of other visual information that could affect the driver's glance behavior. For example, the visual environment on arterials may be more complex or cluttered than on freeways because of the close proximity of buildings, driveways, and on-premise advertising, etc.

READING

The first on-road study was conducted in Reading. This study examined the type of advertising (CEVMS, standard billboard, or no off-premise advertising), time of day (day or night) and road type (freeway or arterial) as independent variables. Eye tracking was used to assess where participants gazed and for how long while driving. The luminance and contrast of the advertising signs were measured to characterize the billboards in the current study.

METHOD

Selection of Data Collection Zone Limits

Data collection zones (DCZ) were defined on the routes that participants drove where detailed analyses of the eye tracking data were planned. The DCZ were identified that contained a CEVMS, a standard billboard, or no off-premise advertising.

The rationale for selecting the DCZ limits took into account the geometry of the roadway (e.g., road curvature or obstructions that blocked view of billboards) and the capabilities of the eye tracking system (2 degrees of resolution). At a distance of 960 ft (292.61 m), the average billboard in Reading was 12.8 ft (3.90 m) by 36.9 ft (11.25 m) and would subtend a horizontal visual angle of 2.20 degrees and a vertical visual angle of 0.76 degrees, and thus glances to the billboard would just be resolvable by an eye tracking system with 2 degrees of accuracy. Therefore 960 ft was chosen as the maximum distance from billboards at which a DCZ would begin. If the target billboard was not visible from 960 ft (292.61 m) due to roadway geometry or other visual obstructions, such as trees or an overpass, the DCZ was shortened to a distance that prevented these objects from interfering with the driver's vision of the billboard. In DCZs with target off-premise billboards, the end of the DCZ was marked when the target billboard left the view of the scene camera. If the area contained no off-premise advertising, the end of the DCZ was defined by a physical landmark leaving the view of the eye tracking systems' scene camera.

Table 2 shows the data collection zone limits used in this study.

Advertising Conditions

The type of advertising present in DCZs was examined as an independent variable. DCZs fell into one of the following categories, which are listed in the second column of table 2:

- **CEVMS**. These were DCZs that contained one target CEVMS. Two CEVMS DCZs were located on freeways and two were located on arterials. Figure 3 and figure 4 show examples of CEVMS DCZs with the CEVMS highlighted in the pictures.

- **Standard billboard**. These were DCZs that contained one target standard billboard. Two standard billboard DCZs were located on freeways and two were located on arterials. Figure 5 and figure 6 show examples of standard billboard DCZs; the standard billboards are highlighted in the pictures.

- **No off-premise advertising conditions**. These DCZs contained no off-premise advertising. One of these DCZs was on a freeway (see figure 7) and the other was on an arterial (see figure 8).

Table 2. Inventory of target billboards with relevant parameters.

DCZ	*Advertising Type*	*Copy Dimensions (ft)*	*Side of Road*	*Setback from Road (ft)*	*Other Standard Billboards*	*Approach Length (ft)*	*Type of Roadway*
1	CONTROL	N/A	N/A	N/A	N/A	786	Freeway
6	CONTROL	N/A	N/A	N/A	N/A	308	Arterial
3	CEVMS	10'6" x 22'9"	L	12	0	375	Arterial
5	CEVMS	14'0" x 48'0"	L	133	1	853	Freeway
9	CEVMS	10'6" x 22'9"	R	43	0	537	Arterial
10	CEVMS	14'0" x 48'0"	R	133	1	991	Freeway
2	Standard	14'0" x 48'0"	L	20	0	644	Arterial
7	Standard	14'0" x 48'0"	R	35	1	774	Freeway
8	Standard	10'6" x 22'9"	R	40	1	833	Arterial
4	Standard	14'0" x 48'0"	L	10	0	770	Freeway

**N/A indicates that there were no off-premise advertising in these areas and these values are undefined.*

Figure 3. DCZ with a target CEVMS on a freeway.

Figure 4. DCZ with a target CEVMS on an arterial.

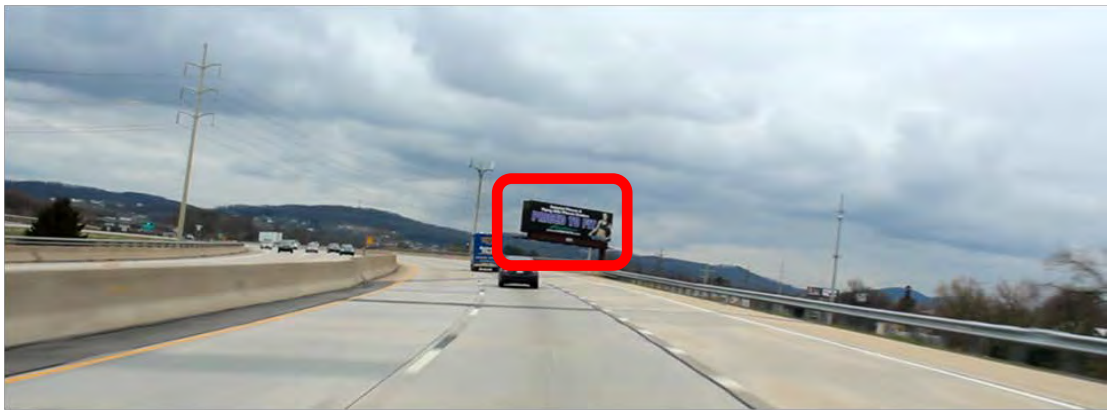

Figure 5. DCZ with a target standard billboard on a freeway.

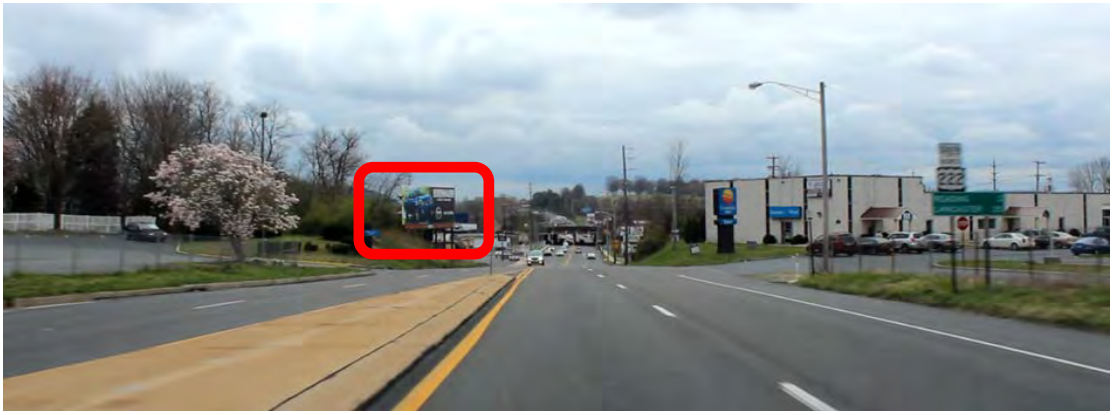

Figure 6. DCZ with a target standard billboard on an arterial.

Figure 7. DCZ for the control condition on a freeway.

Figure 8. DCZ for the control condition on an arterial.

Photometric Measurement of Signs

Two primary metrics were used to describe the photometric characteristics of a sample of the CEVMS and standard billboards present at each location: luminance (cd/m^2) and contrast (Weber contrast ratio).

Photometric Equipment

Luminance was measured with a Radiant Imaging ProMetric 1600 Charge-Coupled Device (CCD) photometer with both a 50 mm and a 300 mm lenses. The CCD photometer provided a method of capturing the luminance of an entire scene at one time.

The photometric sensors were mounted in a vehicle of similar size to the eye tracking research vehicle. The photometer was located in the experimental vehicle as close to the driver's position as possible and was connected to a laptop computer that stored data as the images were acquired.

Measurement Methodology

Images of the billboards were acquired using the photometer manufacturer's software. The software provided the mean luminance of each billboard message. To prevent overexposure of

images in daylight, neutral density filters were manually affixed to the photometer lens and the luminance values were scaled appropriately. Standard billboards were typically measured only once; however, for CEVMS multiple measures were taken to account for changing content.

Photometric measurements were taken during day and night. Measurements were taken by centering the billboard in the photometer's field of view with approximately the equivalent of the width of the billboard on each side and the equivalent of the billboard height above and below the sign. The areas outside of the billboards were included to enable contrast calculations.

Standard billboards were assessed at a mean distance of 284 ft (ranging from 570 ft to 43 ft). The CEVMS were assessed at a mean distance of 479 ft (ranging from 972 ft to 220 ft). To include the background regions of appropriate size, the close measurement distances required the use of the 50 mm lens whereas measurements made from longer distances required the 300 mm lens. A significant determinant of the measurement locations was the availability of accessible and safe places from which to measure.

The Weber contrast ratio was used because it characterizes a billboard as having negative or positive contrast when compared to its background area.[31] A negative contrast indicates the background areas have a higher mean luminance than the target billboard. A positive contrast indicates the target billboard has a higher mean luminance than the background. Overall, the absolute value of a contrast ratio simply indicates a difference in luminance between an item and its background. From a perceptual perspective luminance and contrast are directly related to the perception of brightness. For example, two signs with equal luminance may be perceived differently with respect to brightness because of differences in contrast.

Visual Complexity

Regan, Young, Lee and Gordon presented a taxonomic description of the various sources of driver distraction.[32] Potential sources of distraction were discussed in terms of: things brought into the vehicle; vehicle systems; vehicle occupants; moving objects or animals in the vehicle; internalized activity; and external objects, events, or activities. The external objects may include buildings, construction zones, billboards, road signs, vehicles, and so on. Focusing on the potential for information outside the vehicle to attract (or distract) the driver's attention, Horberry and Edquist developed a taxonomy for out-of-the-vehicle visual information. This suggested taxonomy includes four groupings of visual information: built roadway, situational entities, natural environment, and built environment.[33] These two taxonomies provide an organizational structure for conducting research; however, they do not currently provide a systematic or quantitative way of classifying the level of clutter or visual complexity present in a visual scene.

The method proposed by Rozenholtz, Li, and Nakano provides quantitative and perhaps reliable measures of visual clutter.[34] Their approach measures the feature congestion in a visual image. The implementation of the feature congestion measure involves four stages: (1) compute local feature covariance at multiple scales and compute the volume of the local covariance ellipsoid, (2) combine clutter across scale, (3) combine clutter across feature types, and (4) pool over space to get a single measure of clutter for each input image. The implementation that was used employed color, orientation and luminance contrast as features. Presumably, less cluttered

images can be visually coded more efficiently than cluttered images. For example, visual clutter can cause decreased recognition performance and greater difficulty in performing visual search.[35]

Participants

In the present study participants were recruited at public libraries in the Reading area. A table was set up so that recruiters could discuss the requirements of the experiment with candidates. Individuals who expressed interest in participating were asked to complete a pre-screening form, a record of informed consent, and a department of motor vehicles form consenting to release of their driving record.

All participants were between 18 and 64 years of age and held a valid driver's license. The driving record for each volunteer was evaluated to eliminate drivers with excessive violations. The criteria for excluding drivers were as follows: (a) more than one violation in the preceding year; (b) more than three recorded violations; and (c) any driving while intoxicated violation.

Forty-three individuals were recruited to participate. Of these, five did not complete the drive because the eye tracker could not be calibrated to track their eye movements accurately. Data from an additional seven participants were excluded as the result of equipment failures (e.g., loose camera). In the end, usable data was collected from 31 participants (12 males, M = 46 years; 19 females, M = 47 years). Fourteen participants drove at night and 17 drove during the day.

Procedures

Data were collected from two participants per day (beginning at approximately 12:45 p.m. and 7:00 p.m.). Data collection began on September 18, 2009, and was completed on October 26, 2009.

Pre-Data Collection Activities

Participants were greeted by two researchers and asked to complete a fitness to drive questionnaire. This questionnaire focused on drivers' self-reports of alertness and use of substances that might impair driving (e.g., alcohol). All volunteers appeared fit.

Next, the participant and both researchers moved to the eye tracking calibration location and the test vehicle. The calibration procedure took approximately 20 minutes. Calibration of the eye tracking system entailed development of a profile for each participant. This was accomplished by taking multiple photographs of the participant's face as they slowly rotate their head from side to side. The saved photographs include points on the face for subsequent real-time head and eye tracking. Marked coordinates on the face photographs were edited by the experimenter as needed to improve the real-time face tracking. The procedure also included gaze calibration in which participants gazed at nine points on a wall. These points had been carefully plotted on the wall and correspond to the points in the eye tracking system's world model. Gaze calibration relates the individual participant's gaze vectors to known points in the real world. The eye tracking system uses two pulsating infrared sources mounted on the dashboard to create two corneal glints that are used to calculate gaze direction vectors. The glints were captured at 60 Hz. A second set

of cameras (scene cameras), fixed on top of the car close to the driver's viewpoint, were used to produce a video scene of the area ahead. The scene cameras recorded at 25 Hz. A parallax correction algorithm compensated for the distance between the driver's viewpoint and the scene cameras so that later processing could use the gaze vectors to show where in the forward scene the driver was gazing.

If it was not possible to calibrate the eye tracking system to a participant, the participant was dismissed and paid for their time. Causes of calibration failure included reflections from eye glasses, participant height (which put their eyes outside the range of the system), and eyelids that obscure a portion of the pupil.

Practice

After eye-tracker calibration, a short practice drive was made. Participants were shown a map of the route and written turn-by-turn directions prior to beginning the practice drive. Throughout the drive, verbal directions were provided by a GPS device.

During the practice drive, a researcher in the rear seat of the vehicle monitored the accuracy of eye tracking. If the system was tracking poorly, additional calibration was performed. If the calibration could not be improved, the participant was paid for their time and dismissed.

Data Collection

Participants drove two test routes (referred to as route A and B). Each route required 25 to 30 minutes to complete and included both freeway and arterial segments. Route A was 13 miles long and contained 6 DCZs. Route B was 16 miles long and contained 4 DCZs. Combined, participants drove in a total of 10 DCZs. Similar to the practice drive, participants were shown a map of the route and written turn-by-turn directions. A GPS device provided turn-by-turn guidance during the drive. Roughly one half of the participants drove route A first and the remaining participants began with route B. A 5 minute break followed the completion of the first route.

During the drives, a researcher in the front passenger seat assisted the driver when additional route guidance was required. The researcher was also tasked with recording near misses and driver errors if these occurred. The researcher in the rear seat monitored the performance of the eye tracker. If the eye tracker performance became unacceptable (i.e., loss of calibration), then the researcher in the rear asked the participant to park in a safe location so that the eye tracker could be recalibrated. This recalibration typically took a minute or two to accomplish.

Debriefing

After driving both routes, the participants provided comments regarding their drives. The comments were in reference to the use of a navigation system. No questions were asked about billboards. The participants were given $120.00 in cash for their participation.

DATA REDUCTION

Eye Tracking Measures

The Multiple-Analysis of Psychophysical and Performance Signals (MAPPS™) software was used to reduce the eye tracking data.[36] The software integrates the video output from the scene cameras with the output from the eye tracking software (e.g., gaze vectors). The analysis software provides an interface in which the gaze vectors determined by the eye tracker can be related to areas or objects in the scene camera view of the world. Analysts can indicate regions of interest (ROIs) in the scene camera views and the analysis software then assigns gaze vectors to the ROIs.

Figure 9 shows a screen capture from the analysis software in which static ROIs have been identified. These static ROIs slice up the scene camera views into six areas. The software also allows for the construction of dynamic ROIs. These are ROIs that move in the video because of own-vehicle movement (e.g., a sign changes position on the display as it is approached by the driver) or because the object moves over time independent of own-vehicle movement (e.g., pedestrian walking along the road, vehicle entering or exiting the road).

Static ROIs need only be entered once for the scenario being analyzed whereas dynamic ROIs need to be entered several times for a given DCZ depending on how the object moves along the video scene; however, not every frame needs to be coded with a dynamic ROI since the software interpolates across frames using the 60-Hz data to compute eye movement statistics.

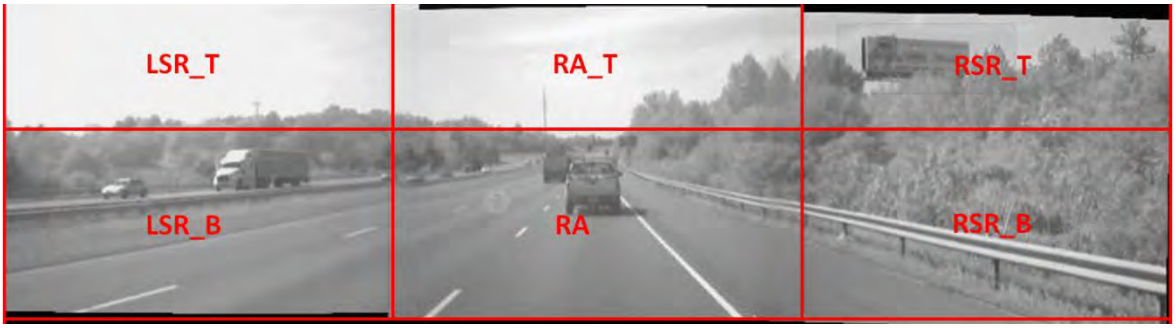

Figure 9. Screen capture showing static ROIs on a scene video output.

The following ROIs were defined with the analysis software:

Static ROIs

These ROIs were entered once into the software for each participant. The static ROIs for the windshield were divided into top and bottom to have more resolution during the coding process. The subsequent analyses in the report combines the top and bottom portion of these ROIs since it appeared that this additional level of resolution was not needed in order to address research questions:

- Road ahead: bottom portion (approximately 2/3) of the area of the forward roadway (center camera).

- Road ahead top: top portion (approximately 1/3) of the area of the forward roadway (center camera).

- Right side of road bottom: bottom portion (approximately 2/3) of the area to the right of the forward roadway (right camera).

- Right side of road top: top portion (approximately 1/3) of the area to the right of the forward roadway (right camera).

- Left side of road bottom (LSR_B): bottom portion (approximately 2/3) of the area to the left of the forward roadway (left camera).

- Left side of road bottom (LSR_T): top portion (approximately 1/3) of the area to the left of the forward roadway (left camera).

- Inside vehicle: below the panoramic video scene (outside of the view of the cameras, but eye tracking is still possible).

- Top: above the panoramic video scene (outside of the view of the cameras, but eye tracking is still possible).

Dynamic ROIs

These ROIs are created multiple times within a DCZ for stimuli that move relative to the driver:

- Driving-related safety risk: vehicle which posed a potential safety risk to the driver, defined as a car that is/may turn into the driver's direction of travel at a non-signalized or non-stop-controlled intersection (e.g., a car making a U-turn, a car waiting to turn right, or a car waiting to turn left). These vehicles were actively turning or entering the roadway or appeared to be in a position to enter the roadway.

- Target standard billboard: target standard billboard that defines the start and end of the DCZ.

- Other standard billboard: standard billboard(s) located in the DCZ, other than the target standard billboard or the target digital billboard.

- CEVMS: target digital billboard that defines the start and end of the DCZ.

The software determines the gaze intersection for each 60 Hz frame and assigns it to an ROI. In subsequent analyses and discussion, gaze intersections are referred to as gazes. Since ROIs may overlap, the software allows for the specification of priority for each ROI such that the ROI with the highest priority gets the gaze vector intersection assigned to it. For example, an ROI for a CEVMS may also be in the static ROI for the road ahead.

The 60 Hz temporal resolution of the eye tracking software does not provide sufficient information to make detailed analysis of saccade characteristics,[1] such as latency or speed. The analysis software uses three parameters in the determination of a fixation: a fixation radius, fixation duration, and a time out. The determination begins with a single-gaze vector intersection. Any subsequent intersection within a specified radius will be considered part of a fixation if the minimum fixation duration criterion is met. The radius parameter used in this study was 2 degrees and the minimum duration was 100 ms. The 2-degree selection was based on the estimated accuracy of the eye tracking system, as recommended by Recarte and Nunes.[37] The 100 ms minimum duration is consistent with many other published studies; however, some investigators use minimums of as little as 60 ms.[37,38] Because of mini-saccades and noise in the eye tracking system, it is possible to have brief excursions outside the 2 degree window for a fixation. In this study, an excursion time outside the 2-degree radius of less than 90 ms was ignored. Once the gaze intersection fell outside the 2-degree radius of a fixation for more than 90 ms, the process of identifying a fixation began anew.

Other Measures

Driving Behavior Measures

During data collection, the front-seat researcher observed the driver's behavior and the driving environment. The researcher used the following subjective categories in observing the participant's driving behavior:

- **Driver Error:** signified any error on behalf of the driver in which the researcher felt slightly uncomfortable, but not to a significant degree (e.g., driving on an exit ramp too quickly, turning too quickly).

- **Near Miss:** signified any event in which the researcher felt uncomfortable due to driver response to external sources (e.g., slamming on brakes, swerving). A near miss is the extreme case of a driver error.

- **Incident:** signified any event in the roadway which may have had a potential impact on the attention of the driver and/or the flow of traffic (e.g., crash, emergency vehicle, animal, construction, train).

These observations were entered into a notebook computer linked to the research vehicle data collection system.

Level of Service Estimates

For each participant and each DCZ the analyst estimated the level of service of the road as they reviewed the scene camera video. One location per DCZ was selected (approximately halfway through the DCZ) where the number of vehicles in front of the research vehicle was counted. The procedure entailed (1) counting the number of travel lanes visible in the video, (2) using the

[1] During visual scanning, the point of gaze alternates between brief pauses (ocular fixations) and rapid shifts (saccades).

skip lines on the road to estimate the approximate distance in front of the vehicle that constituted the analysis zone, and (3) counting the number of vehicles present within the analysis zone. Vehicle density was calculated with the formula:

> Vehicle Density = [(Number of Vehicles in Analysis Zone)/(Distance of Analysis Zone in ft/5280)]/Number of Lanes.

Vehicle density is the number of vehicles per mile per lane.

Vehicle Speed

The speed of the research vehicle was recorded with GPS and a distance measurement instrument. Vehicle speed was used principally to ensure that the eye tracking data was recorded while the vehicle was in motion.

RESULTS

Results are presented with respect to the photometric measures of signs, the visual complexity of the DCZs, and the eye tracking measures. Photometric measurements were taken and analyzed to characterize the billboards in the study based on their luminance and contrasts, which are related to how bright the signs are perceived to be by drivers.

Photometric Measurements

Luminance

The mean daytime luminance of both the standard billboards and CEVMS was greater than at night. Nighttime luminance measurements reflect the fact that CEVMS use illuminating LED components while standard billboards are often illuminated from below by metal halide lamps. At night, CEVMS have a greater average luminance than standard billboards. Table 3 presents summary statistics for luminance as a function of time of day for the CEVMS and standard billboards.

Contrast

The daytime and nighttime Weber contrast ratios for both types of billboards are shown in table 3. Both CEVMS and standard billboards had contrast ratios that were close to zero (the surroundings were about equal in brightness to the signs) during the daytime. On the other hand, at night the CEVMS and standard billboards had positive contrast ratios (the signs were brighter than the surrounding), with the CEVMS having higher contrast than the standard billboards.

Table 3. Summary of luminance (cd/m^2) and contrast (Weber ratio) measurements.

	Luminance (cd/m^2)		*Contrast*	
Day	*Mean*	*St. Dev.*	*Mean*	*St .Dev.*
CEVMS	2126	798.81	-0.10	0.54
Standard Billboard	2993	2787.22	-0.27	0.84
Night				
CEVMS	56.00	23.16	73.72	56.92
Standard Billboard	17.80	17.11	36.01	30.93

Visual Complexity

The DCZs were characterized by their overall visual complexity or clutter. For each DCZ, five pictures were taken from the driver's viewpoint at various locations within the DCZ. In Reading, the pictures were taken from 2:00 p.m. to 4:00 p.m. In Richmond, one route was photographed from 11:00 a.m. to noon and the other from 2:30 p.m. to 3:30 p.m. The pictures were taken at the start of the DCZ, quarter of the way through, half of the way through, three quarters of the way through, and at the end of the DCZ. The photographs were analyzed with MATLAB® routines that computed a measure of feature congestion for each image. Figure 10 shows the mean feature congestion measures for each of the DCZ environments. The arterial control condition was shown to have the highest level of clutter as measured by feature congestion. An analysis of variance was performed on the feature congestion measure to determine if the conditions differed significantly from each other. The four conditions with off-premise advertising did not differ significantly with respect to feature congestion; $F(3,36) = 1.25$, $p > 0.05$. Based on the feature congestion measure, the results indicate that the four conditions with off-premise advertising were equated with respect to the overall visual complexity of the driving scenes.

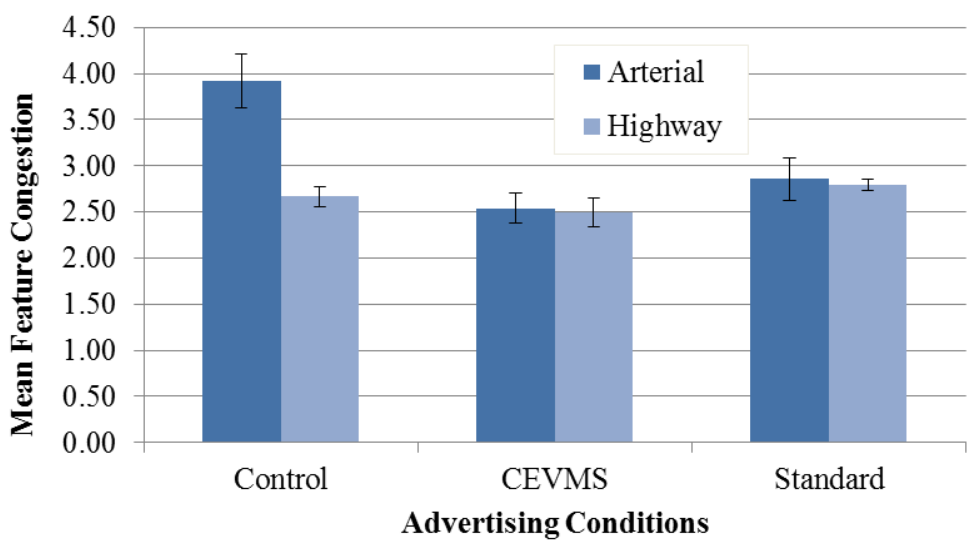

Figure 10. Mean feature congestion as a function of advertising condition and road type (standard errors for the mean are included in the graph).

Effects of Billboards on Gazes to the Road Ahead

For each 60 Hz frame, a determination was made as to the direction of the gaze vector. Previous research has shown that gazes do not need to be separated into saccades and fixations before calculating such measures as percent of time or the probability of looking to the road ahead.[39] This analysis examines the degree to which drivers gaze toward the road ahead across the different advertising conditions as a function of road type and time of day. Gazing toward the road ahead is critical for driving, and so the analysis examines the degree to which gazes toward this area are affected by the independent variables (advertising type, type of road, and time of day) and their interactions.

Generalized estimating equations (GEE) were used to analyze the probability of a participant gazing at driving-related information.[40,41] The data for these analyses were not normally distributed and included repeated measures. The GEE model is appropriate for these types of data and analyses. Note that for all results included in this report, Wald statistics were the chosen alternative to likelihood ratio statistics because GEE uses quasi-likelihood instead of maximum likelihood.[42] For this analysis, road ahead included the following ROIs (as previously described and displayed in figure 9): road ahead, road ahead top, and driving-related risks. A logistic regression model for repeated measures was generated by using a binomial response distribution and Logit (i.e., log odds) link function. Only two possible outcomes are allowed when selecting a binomial response distribution. Thus, a variable (RoadAhead) was created to classify a participant's gaze behavior. If the participant gazed toward the road ahead, road ahead top, or driving-related risks, then the value of RoadAhead was set to one. If the participant gazed at any other object in the panoramic scene, then the value of RoadAhead was set to zero. Logistic regression typically models the probability of a success. In the current analysis, a success would be a gaze to road ahead information (RoadAhead = 1) and a failure would be a gaze toward non-road ahead information (RoadAhead = 0). The resultant value was the probability of a participant gazing at road-ahead information.

Time of day (day or night), road type (freeway or arterial), advertising condition (CEVMS, standard billboard, or control), and all corresponding second-order interactions were explanatory variables in the logistic regression model. The interaction of advertising condition by road type was statistically significant, χ^2 (2) = 6.3, p = 0.043. Table 4 shows the corresponding probabilities for gazing at the road ahead as a function of advertising condition and road type.

Table 4. The probability of gazing at the road ahead as a function of advertising condition and road type.

Advertising Condition	*Arterial*	*Freeway*
Control	0.92	0.86
CEVMS	0.82	0.73
Standard	0.80	0.77

Follow-up analyses for the interaction used Tukey-Kramer adjustments with an alpha level of 0.05. The arterial control condition had the greatest probability of looking at the road ahead (M = 0.92). This probability differed significantly from the remaining five probabilities. On

arterials, the probability of gazing at the road ahead did not differ between the CEVMS (M = 0.82) and the standard billboard (M = 0.80) DCZs. In contrast, there was a significant difference in this probability on freeways, where standard billboard DCZs yielded a higher probability (M = 0.77) than CEVMS DCZs (M = 0.73). The probability of gazing at the road ahead was also significantly higher in the freeway control DCZ (M = 0.86) than in either of the corresponding freeway off-premise advertising DCZs. The probability of gazing at road-ahead information in arterial CEVMS DCZs was not statistically different from the same probability in the freeway control DCZ.

Additional descriptive statistics were computed to determine the probability of gazing at the various ROIs that were defined in the panoramic scene. Some of the ROIs depicted in figure 9 were combined in the following fashion for ease of analysis:

- Road ahead, road ahead top, and driving-related risks combined to form *road ahead*.
- Left side of road bottom and left side of road top combined to form *left side of vehicle*.
- Right side of road bottom and right side of road top combined to form *right side of vehicle*.
- Inside vehicle and top combined to form *participant vehicle*.

Table 5 presents the probability of gazing at the different ROIs.

Table 5. Probability of gazing at ROIs for the three advertising conditions on arterials and freeways.

Road Type	*ROI*	*CEVMS*	*Standard Billboard*	*Control*
Arterial	*CEVMS*	0.07	N/A	N/A
	Left Side of Vehicle	0.06	0.06	0.02
	Road ahead	0.82	0.80	0.92
	Right Side of Vehicle	0.03	0.06	0.04
	Standard Billboard	N/A	0.03	N/A
	Participant Vehicle	0.03	0.05	0.02
Freeway	*CEVMS*	0.05	N/A	N/A
	Left Side of Vehicle	0.08	0.07	0.04
	Road ahead	0.73	0.77	0.86
	Right Side of Vehicle	0.09	0.02	0.05
	Standard Billboard	0.02*	0.09	N/A
	Participant Vehicle	0.04	0.05	0.05

* The CEVMS DCZs on freeways each contained one visible standard billboard.

The probability of gazing away from the forward roadway ranged from 0.08 to 0.27. In particular, the probability of gazing toward a CEVMS was greater on arterials (M = 0.07) than on freeways (M = 0.05). In contrast, the probability of gazing toward a target standard billboard was greater on freeways (M = 0.09) than on arterials (M = 0.03).

Fixations to CEVMS and Standard Billboards

About 2.4 percent of the fixations were to CEVMS. The mean fixation duration to a CEVMS was 388 ms and the maximum duration was 1,251 ms. Figure 11 shows the distribution of fixation durations to CEVMS during the day and night. In the daytime, the mean fixation duration to a CEVMS was 389 ms and at night it was 387 ms. Figure 12 shows the distribution of fixation durations to standard billboards. Approximately 2.4 percent of fixations were to standard billboards. The mean fixation duration to standard billboards was 341 ms during the daytime and 370 ms at night. The maximum fixation duration to standard billboards was 1,284 ms (which occurred at night). For comparison purposes, figure 13 shows the distribution of fixation durations to the road ahead (i.e., top and bottom road ahead ROIs) during the day and night. In the daytime, the mean fixation duration to the road ahead was 365 ms and at night it was 390 ms.

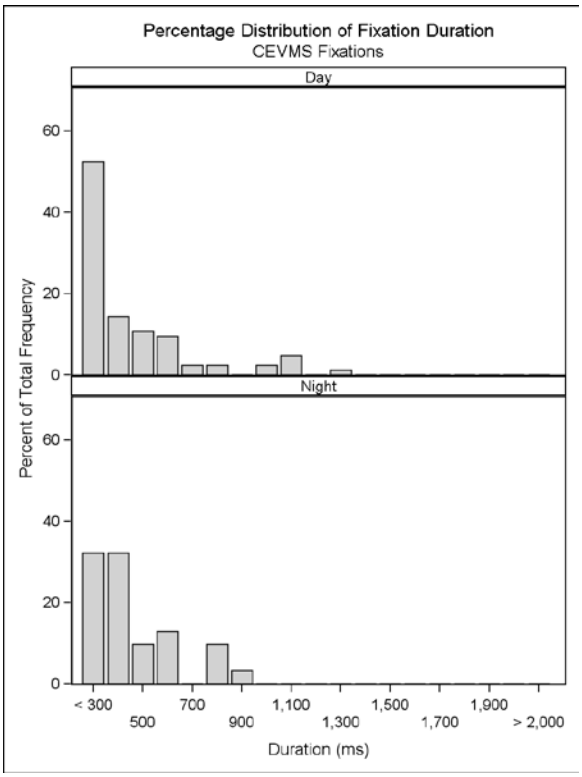

Figure 11. Distribution of fixation duration for CEVMS in the daytime and nighttime.

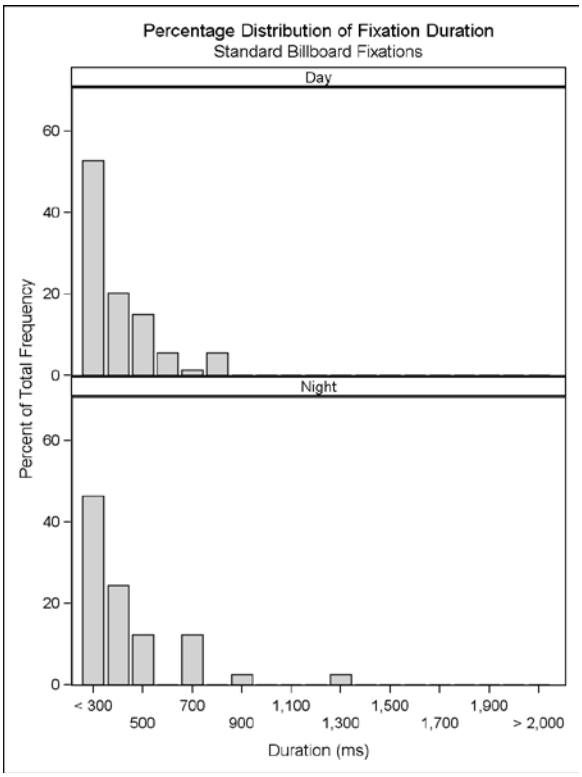

Figure 12. Distribution of fixation duration for standard billboards in the daytime and nighttime.

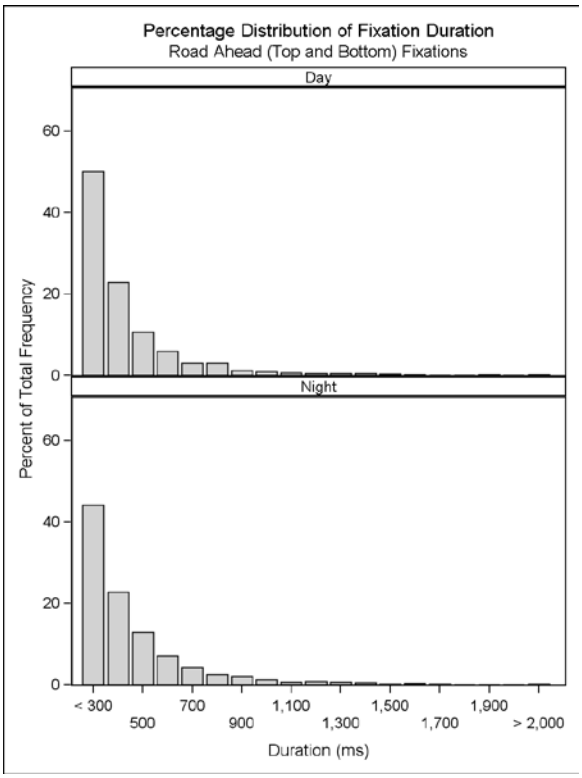

Figure 13. Distribution of fixation duration for road ahead (i.e., top and bottom road ahead ROIs) in the daytime and nighttime.

Dwell times on CEVMS and standard billboards were also examined. Dwell time is the duration of back-to-back fixations to the same ROI.[43,44] The dwell times represent the cumulative time for the back-to-back fixations. Whereas there may be no long, single fixation to a billboard, there might still be multiple fixations that yield long dwell times. There were a total of 25 separate instances of multiple fixations to CEVMS with a mean of 2.4 fixations (minimum of 2 and maximum of 5). The 25 dwell times came from 15 different participants distributed across four different CEVMS. The mean duration of these dwell times was 994 ms (minimum of 418 ms and maximum of 1,467 ms).

For standard billboards, there were a total of 17 separate dwell times with a mean of 3.47 sequential fixations (minimum of 2 fixations and maximum of 8 fixations). The 17 dwell times came from 11 different participants distributed across 4 different standard billboards. The mean duration of these multiple fixations was 1,172 ms (minimum of 418 ms and maximum of 3,319 ms). There were three dwell-time durations that were greater than 2,000 ms. These are described in more detail below.

In some cases several dwell times came from the same participant. In order to compute a statistic on the difference between dwell times for CEVMS and standard billboards, average dwell times were computed per participant for the CEVMS and standard billboard conditions. These average values were used in a t-test assuming unequal variances. The difference in average dwell time between CEVMS (M = 981 ms) and standard billboards (M= 1,386 ms) was not statistically significant, $t(12) = -1.40$, $p > .05$.

Figure 14 through figure 23 show heat maps for the dwell-time durations to the standard billboards that were greater than 2,000 ms. These heat maps are snapshots from the DCZ and attempt to convey in two dimensions the pattern of gazes that took place in a three dimensional world. The heat maps are set to look back approximately one to two seconds and integrate over time where the participant was gazing in the scene camera video. The green color in the heat map indicates the concentration of gaze over the past one to two seconds. The blue line indicates the gaze trail over the past one to two seconds.

Figure 14 through figure 16 are for a DCZ on an arterial at night. The standard billboard was on the right side of the road (indicated by a pink rectangle). There were eight fixations to this billboard, and the single fixations were between 200 to 384 ms in duration. The dwell time for this billboard was 2,019 ms. At the start of the DCZ (see figure 14), the driver was directing his/her gaze to the forward roadway. Approaching the standard billboard, the driver began to fixate on the billboard. However, the billboard was still relatively close to the road ahead ROI.

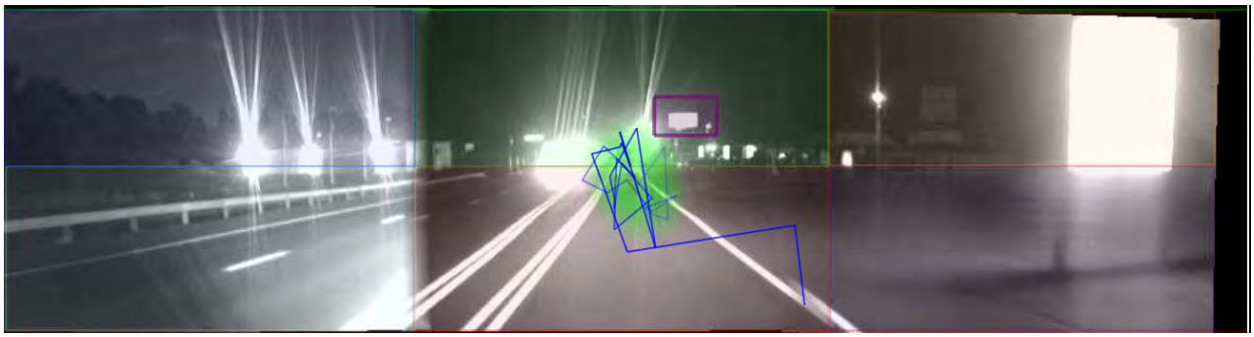

Figure 14. Heat map for the start of a DCZ for a standard billboard at night on an arterial.

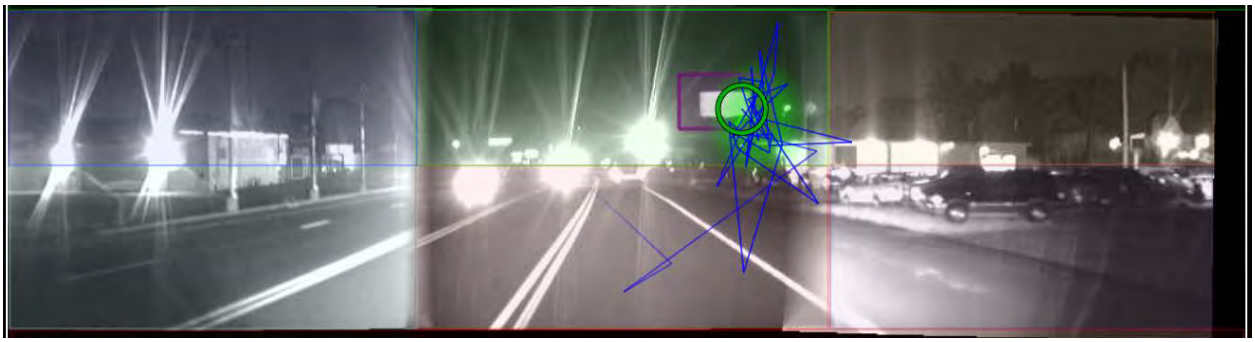

Figure 15. Heat map for the middle of a DCZ for a standard billboard at night on an arterial.

Figure 16. Heat map near the end of a DCZ for a standard billboard at night on an arterial.

Figure 17 through figure 19 are for a DCZ on a freeway at night. The standard billboard was on the right side of the road (indicated by a green rectangle). There were six consecutive fixations to this billboard, and the single fixations were between 200 and 801 ms in duration. The dwell time for this billboard was 2,753 ms. At the start of the DCZ (see figure 17), the driver was directing his/her gaze to a freeway guide sign in the road ahead and the standard billboard was to the left of the freeway guide sign. As the driver approached the standard billboard, his/her gaze was directed toward the billboard. The billboard was relatively close to the top and bottom road ahead ROIs. Near the end of the DCZ (see figure 19), the billboard was accurately portrayed as being on the right side of the road.

Figure 17. Heat map for start of a DCZ for a standard billboard at night on a freeway.

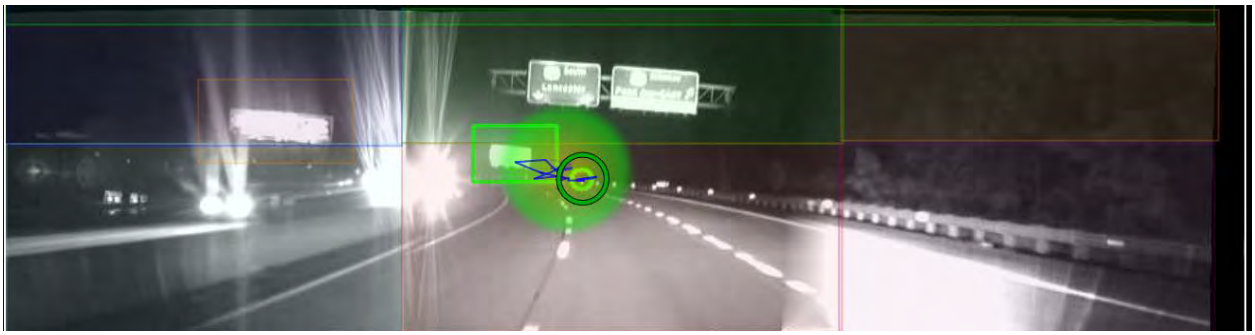

Figure 18. Heat map for middle of a DCZ for a standard billboard at night on a freeway.

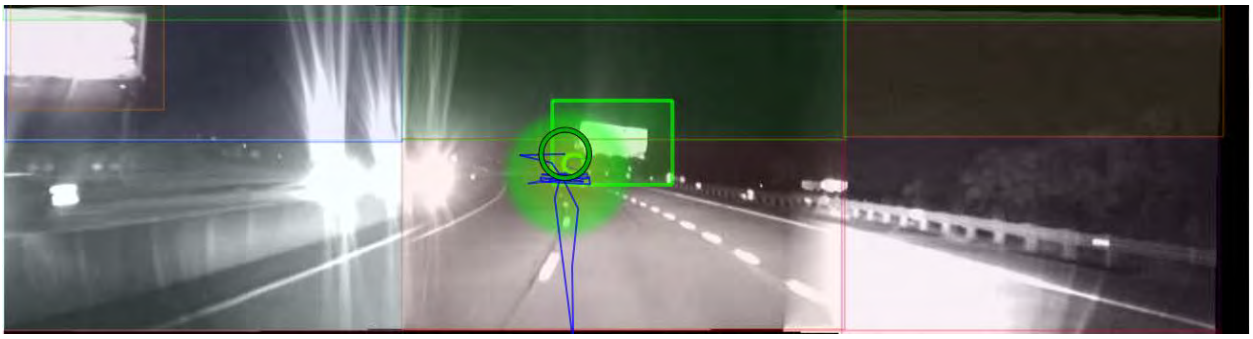

Figure 19. Heat map near the end of a DCZ for a standard billboard at night on a freeway.

Figure 20 through figure 23 are for a DCZ on a freeway during the day. The standard billboard was on the right side of the road (indicated by a pink rectangle). This is the same DCZ that was discussed in figure 17 through figure 19. There were six consecutive fixations to this billboard, and the single fixations were between 217 and 767 ms in duration. The dwell time for this billboard was 3,319 ms. At the start of the DCZ (see figure 20), the driver was principally directing his/her gaze to the road ahead. Figure 21 and figure 22 show the location along the DCZ where gaze was directed toward the standard billboard. The billboard was relatively close to the top and bottom road-ahead ROIs. As the driver passed the standard billboard, his/her gaze returned to the road ahead (see figure 23).

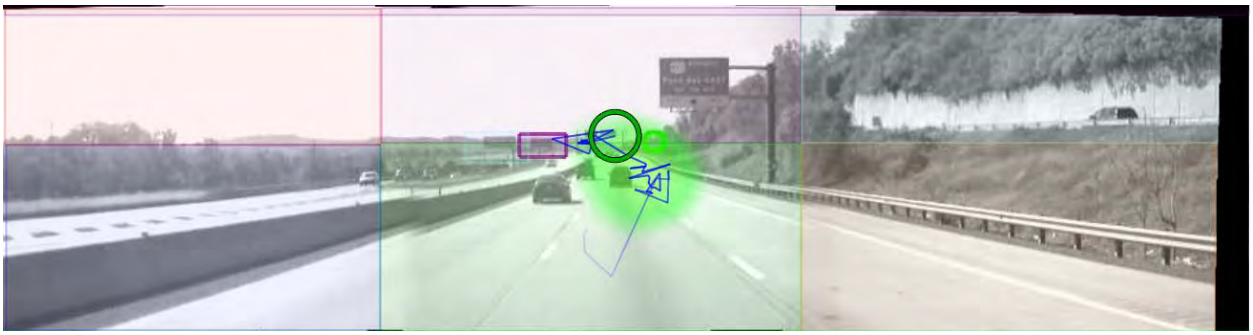

Figure 20. Heat map for the start of a DCZ for a standard billboard in the daytime on a freeway.

Figure 21. Heat map near the middle of a DCZ for a standard billboard in the daytime on a freeway.

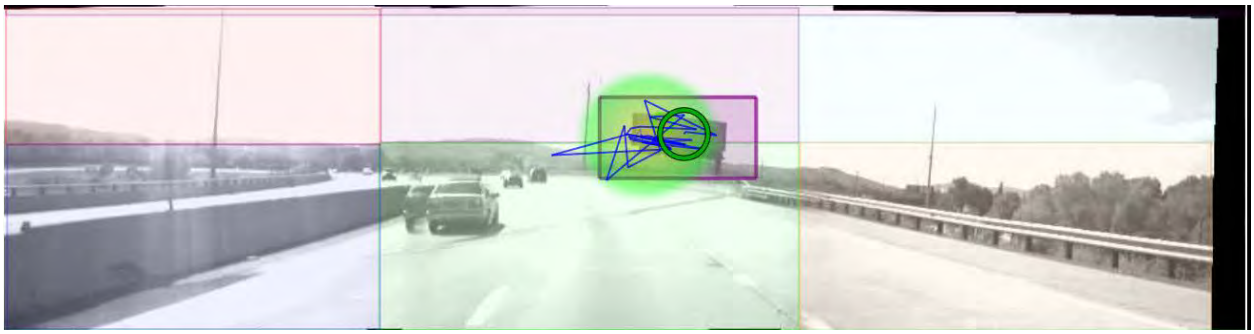

Figure 22. Heat map near the end of DCZ for standard billboard in the daytime on a freeway.

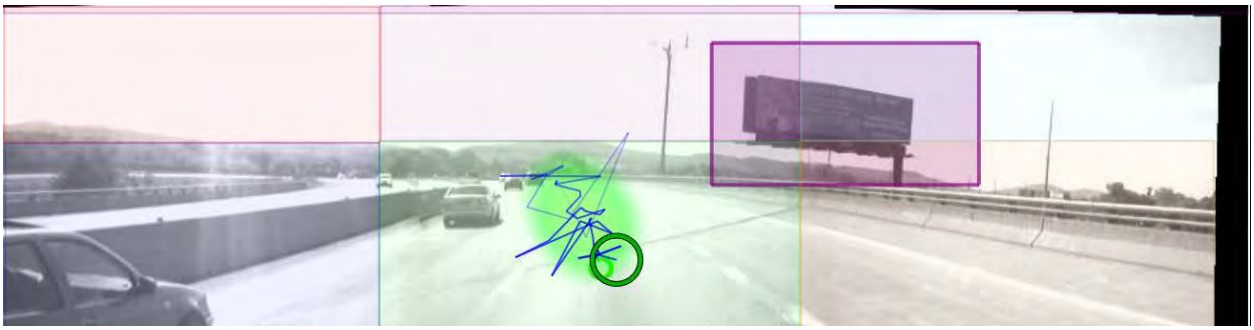

Figure 23. Heat map at the end of DCZ for standard billboard in the daytime on a freeway.

Comparison of Gazes to CEVMS and Standard Billboards

The GEE were used to analyze whether a participant gazed more toward CEVMS than toward standard billboards, given that the participant was gazing at off-premise advertising. With this analysis method, a logistic regression model for repeated measures was generated by using a binomial response distribution and Logit link function. First, the data was partitioned to include only those instances when a participant was gazing toward off-premise advertising (either to a CEVMS or to a standard billboard); all other gaze behavior was excluded from the input data set. Only two possible outcomes are allowed when selecting a binomial response distribution. Thus, a variable (SBB_CEVMS) was created to classify a participant's gaze behavior. If the participant gazed toward a CEVMS, the value of SBB_CEVMS was set to one. If the participant gazed toward a standard billboard, then the value of SBB_CEVMS was set to zero.

Logistic regression typically models the probability of a success. In the current analysis, a success would be a gaze to a CEVMS (SBB_CEVMS = 1) and a failure would be a gaze to a standard billboard (SBB_CEVMS = 0).[2] A success probability greater than 0.5 indicates there were more successes than failures in the sample. Therefore, if the sample probability of the response variable (i.e., SBB_CEVMS) was greater than 0.5, this would show that participants gazed more toward CEVMS than toward standard billboards when the participants gazed at off-premise advertising. In contrast, if the sample probability of the response variable was less than 0.5, then participants showed a preference to gaze more toward standard billboards than toward CEVMS when directing gazes to off-premise advertising.

Time of day (i.e., day or night), road type (i.e., freeway or arterial), and the corresponding interaction were explanatory variables in the logistic regression model. Road type was the only predictor to have a significant effect, $\chi^2(1) = 13.17$, $p < 0.001$. On arterials, participants gazed more toward CEVMS than toward standard billboards (M = 0.63). In contrast, participants gazed more toward standard billboards than toward CEVMS when driving on freeways (M = 0.33).

Observation of Driver Behavior

No near misses or driver errors were observed in Reading.

Level of Service

The mean vehicle densities were converted to level of service as shown in table 6.[(45)] As expected, less congestion occurred at night than in the day. In general, there was traffic during the data collection runs. Review of the scene camera data verified that all eye tracking data within the DCZs were recorded while the vehicle was in motion.

[2] Success and failure are not used to reflect the merits of either type of sign, but only for statistical purposes.

Table 6. Level of service as a function of advertising type, road type, and time of day.

	Arterial		*Freeway*	
	Day	Night	Day	Night
Control	B	A	C	B
CEVMS	C	A	B	A
Standard	A	A	B	A

DISCUSSION OF READING RESULTS

Overall the probability of gazing at the road ahead was high and similar in magnitude to what has been found in other field studies addressing billboards.[11,9,12] For the DCZs on freeways, CEVMS showed a lower proportion of gazes to the road ahead than the standard billboard condition, and both off-premise advertising conditions had lower probability of gazes to the road ahead than the control. On the other hand, on the arterials, the CEVMS and standard billboard conditions did not differ from each other but were significantly different from their respective control condition. Though the CEVMS condition on the freeway had the lowest proportion of gazes to the road ahead, in this condition there was a lower proportion of gazes to CEVMS as compared to the arterials (see table 5 for the trade-off of gazes to the different ROIs). A greater proportion of gazes to other ROIs (left side of the road, right side of the road, and participant vehicle) contributed to the decrease in proportion of gazes to the road ahead. Also, for the CEVMS on freeways, there were a few gazes to a standard billboard located in the same DCZ and there were more gazes distributed to the left and right side of the road than in standard billboard and control conditions. The gazes to ROIs other than CEVMS contributed to the lower probability of gazes to the road ahead in this condition.

The control condition on the arterial had buildings along the sides of the road and generally presented a visually cluttered area. As was presented earlier, the feature congestion measure computed on a series of photographs from each DCZ showed a significantly higher feature congestion score for the control condition on arterials as compared to all of the other DCZs. Nevertheless, the highest probability for gazing at the road ahead was seen in the control condition on the arterial.

The area with the highest feature congestion, especially on the sides of the road, had the highest probability for drivers looking at the road ahead. Bottom-up or stimulus driven measures of salience or visual clutter have been useful in predicting visual search and the effects of visual salience in laboratory tasks.[34,46] These measures of salience basically consider the stimulus characteristics (e.g., size, color, brightness) independent of the requirements of the task or plans that an individual may have. Models of visual salience may predict that buildings and other prominent features on the side of the road may be visually salient objects and thus would attract a driver's attention.[47] Figure 24 shows an example of a roadway photograph that was analyzed with the Salience Toolbox based on the Itti et al. implementation of a saliency based model of bottom-up attention.[48,49] The numbered circles in figure 24 are the first through fifth salient areas selected by the software. Based on this software, the most salient areas in the photographs are the buildings on the sides of the road where the road ahead (and a car) is the fifth selected salient area.

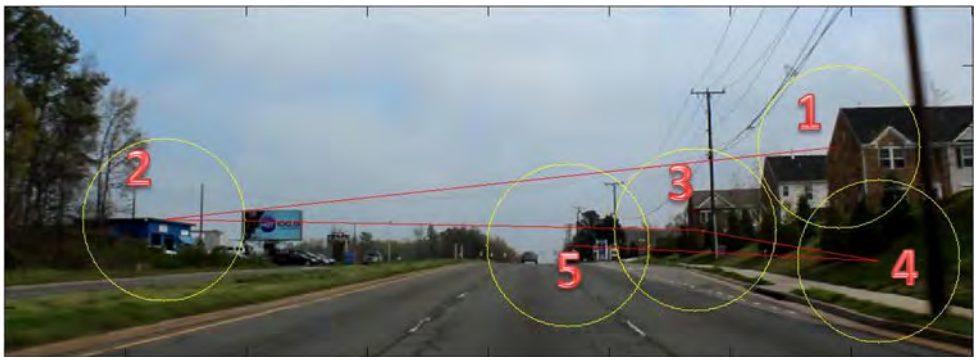

Figure 24. Example of identified salient areas in a road scene based on bottom-up analysis.

It appears that in the present study participants principally kept their eyes on the road even in the presence of visual clutter on the sides of the road, which supports the hypothesis that drivers tend to look toward information relevant to the task at hand.[50,26,22] In the case of the driving task, visual clutter may be more of an issue with respect to crowding that may affect the driver's ability to detect visual information in the periphery.[51] Crowding is generally defined as the negative effect of nearby objects or features on visual discrimination of a target.[52] Crowding impairs the ability to recognize objects in clutter and principally affects perception in peripheral vision. However, crowing effects were not analyzed in the present study.

Stimulus salience, clutter, and the nature of the task at hand interact in visual perception. For tasks such as driving, the task demands tend to outweigh stimulus salience when it comes to gaze control. Clutter may be more of an issue with the detection and recognition of objects in peripheral vision (e.g., detecting a sign on the side of the road) that are surrounded by other stimuli that result in a crowding effect.

The mean fixation durations to CEVMS, standard billboards, and the road ahead were found to be very similar. Also, there were no long fixations (greater than 2,000 ms) to CEVMS or standard billboards. The examination of multiple sequential fixations to CEVMS yielded average dwell times that were less than 1,000 ms. However, when examining the tails of the distribution, there were three dwell times to standard billboards that were in excess of 2,000 ms (the three dwell times came from three different participants to two different billboards). These three standard billboards were dwelled upon when they were near the road ahead area but drivers quit gazing at the signs as they neared them and the signs were no longer near the forward field of view. Though there were three dwell times for standard billboards greater than 2,000 ms, the difference in average dwell times for CEVMS and standard billboards was not significant.

Using a gaze duration of 2,000 ms away from the road ahead as a criterion indicative of increased risk has been developed principally as it relates to looking inside the vehicle to in-vehicle information systems and other devices (e.g., for texting) where the driver is indeed looking completely away from the road ahead.[14,53,54] The fixations to the standard billboards in the present case showed a long dwell time for a billboard. However, unlike gazing or fixating inside the vehicle, the driver's gaze was within the forward roadway where peripheral vision could be used to monitor for hazards and for vehicle control. Peripheral vision has been shown to be important for lane keeping, visual search orienting, and monitoring of surrounding objects.[55,56]

The results showed that drivers were more likely to gaze at CEVMS on arterials and at standard billboards on freeways. Though every attempt was made to select CEVMS and standard billboard DCZs that were equated on important parameters (e.g., which side of the road the sign was located on, type of road, level of visual clutter), the CEVMS DCZs on freeways had a greater setback from the road (133 ft for both CEVMS) than the standard billboards (10 and 35 ft). Signs with greater setback from the road would in a sense move out of the forward view (road ahead) more quickly than signs that are closer to the road. The CEVMS and standard billboards on the arterials were more closely matched with respect to setback from the road (12 and 43 ft for CEVMS and 20 and 40 ft for standard billboards).

The differences in setback from the road for CEVMS and standard billboards may also account for differences in dwell times to these two types of billboards. However, on arterials where the CEVMS and standard billboards were more closely matched there was only one long dwell time (greater than 2,000 ms) and it was to a standard billboard at night.

RICHMOND

The objectives of the second study were the same as those in the first study, and the design of the Richmond data collection effort was very similar to that employed in Reading. This study was conducted to replicate as closely as possible the design of Reading in a different driving environment. The independent variables included the type of DCZ (CEVMS, standard billboard, or no off-premise advertising), time of day (day or night) and road type (freeway or arterial). As with Reading, the time of day was a between-subjects variable and the other variables were within subjects.

METHOD

Selection of DCZ Limits

Selection of the DCZ limits procedure was the same as that employed in Reading.

Advertising Type

Three DCZ types (similar to those used in Reading) were used in Richmond:

- **CEVMS.** DCZs contained one target CEVMS.
- **Standard billboard.** DCZs contained one target standard billboard.
- **Control conditions.** DCZs did not contain any off-premise advertising.

There were an equal number of CEVMS and standard billboard DCZs on freeways and arterials. Also, there two DCZ that did not contain off-premise advertising with one located on a freeway and the other on an arterial.

Table 7 is an inventory of the target employed in this second study.

Table 7. Inventory of target billboards in Richmond with relevant parameters.

DCZ	*Advertising Type*	*Copy Dimensions (ft)*	*Side of Road*	*Setback from Road (ft)*	*Other Standard Billboards*	*Approach Length (ft)*	*Roadway Type*
5	CONTROL	N/A	N/A	N/A	N/A	710	Arterial
3	CONTROL	N/A	N/A	N/A	N/A	845	Freeway
9	CEVMS	14'0" x 28'0"	L	37	0	696	Arterial
13	CEVMS	14'0" x 28'0"	R	37	0	602	Arterial
2	CEVMS	12'5" x 40'0"	R	91	0	297	Freeway
8	CEVMS	11'0 x 23'0"	L	71	0	321	Freeway
10	Standard	14'0" x 48'0"	L	79	1	857	Arterial
12	Standard	10'6" x 45'3"	R	79	2	651	Arterial
1	Standard	14'0" x 48'0"	L	87	0	997	Freeway
7	Standard	14'0" x 48'0"	R	88	0	816	Freeway

** N/A indicates that there were no off-premise advertising in these areas and these values are undefined.*

Figure 25 through figure 30 below represent various pairings of DCZ type and road type. Target off-premise billboards are indicated by red rectangles.

Figure 25. Example of a CEVMS DCZ on a freeway.

Figure 26. Example of CEVMS DCZ an arterial.

Figure 27. Example of a standard billboard DCZ on a freeway.

Figure 28. Example of a standard billboard DCZ on an arterial.

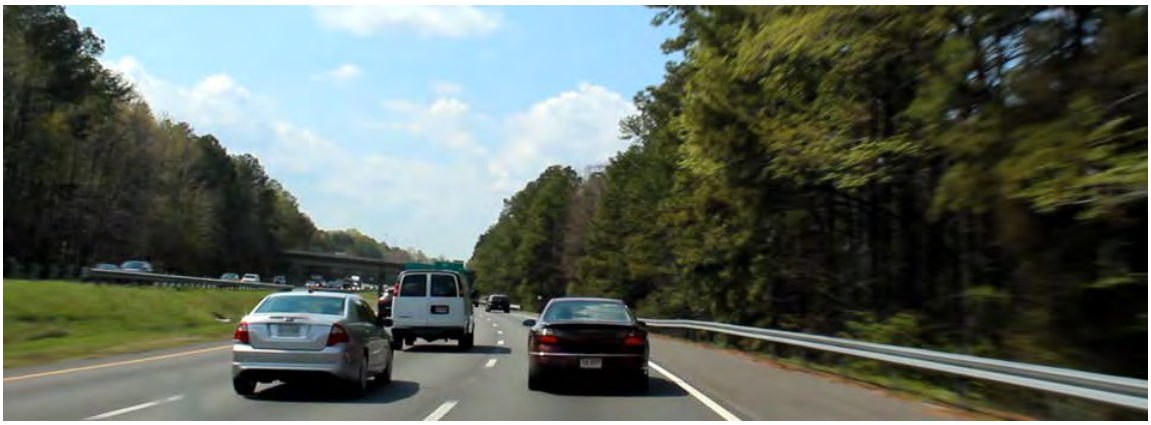

Figure 29. Example of a control DCZ on a freeway.

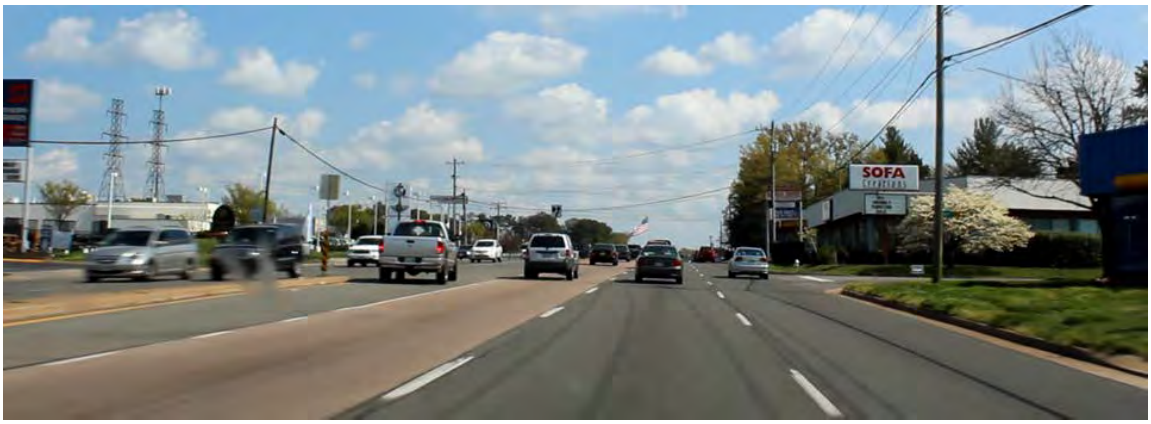

Figure 30. Example of a control DCZ on an arterial.

Photometric Measurement of Signs

The methods and procedures for the photometric measures were the same as for Reading.

Visual Complexity

The methods and procedures for visual complexity measurement were the same as for Reading.

Participants

A total of 41 participants were recruited for the study. Of these, 6 participants did not complete data collection because of an inability to properly calibrate with the eye tracking system, and 11 were excluded because of equipment failures. A total of 24 participants (13 male, M = 28 years; 11 female, M = 25 years) successfully completed the drive. Fourteen people participated during the day and 10 participated at night.

Procedures

Research participants were recruited locally by means of visits to public libraries, student unions, community centers, etc. A large number of the participants were recruited from a nearby university, resulting in a lower mean participant age than in Reading.

Participant Testing

Two people participated each day. One person participated during the day beginning at approximately 12:45 p.m. The second participated at night beginning at around 7:00 p.m. Data collection ran from November 20, 2009, through April 23, 2010. There were several long gaps in the data collection schedule due to holidays and inclement weather.

Pre-Data Collection Activities

This was the same as in Reading.

Practice Drive

Except for location, this was the same as in Reading.

Data Collection

The procedure was much the same as in Reading. On average, each test route required approximately 30 to 35 minutes to complete. As in Reading, the routes included a variety of freeway and arterial driving segments. One route was 15 miles long and contained two target CEVMS, two target standard billboards, and two DCZs with no off-premise advertising. The second route was 20 miles long and had two target CEVMS and two target standard billboards.

The data collection drives in this second study were longer than those in Reading. The eye tracking system had problems dealing with the large files that resulted. To mitigate this technical difficulty, participants were asked to pull over in a safe location during the middle of each data collection drive so that new data files could be initiated.

Upon completion of the data collection, the participant was instructed to return to the designated meeting location for debriefing.

Debriefing

This was the same as in Reading.

DATA REDUCTION

Eye Tracking Measures

The approach and procedures were the same as used in Reading.

Other Measures

The approach and procedures were the same as used in Reading.

RESULTS

Photometric Measurement of Signs

The photometric measurements were performed using the same equipment and procedures that were employed in Reading with a few minor changes. Photometric measurements were taken during the day and at night. Measurements of the standard billboards were taken at an average distance of 284 ft, with maximum and minimum distances of 570 ft and 43 ft, respectively. The average distance of measurements for the CEVMS was 479 ft, with maximum and minimum distances of 972 ft and 220 ft, respectively. Again, the distances employed were significantly affected by the requirement to find a safe location on the road from which to take the measurements.

Luminance

The mean luminance of CEVMS and standard billboards, during daytime and nighttime are shown below in table 8. The results here are similar to those for Reading.

Contrast

The daytime and nighttime Weber contrast ratios for both types of billboards are shown in table 8. During the day, the contrast ratios of both CEVMS and standard billboards were close to zero (the surroundings were about equal in brightness to the signs). At night, the CEVMS and standard billboards had positive contrast ratios. Similar to Reading, the CEVMS showed a higher contrast ratio than the standard billboards at night.

Table 8. Summary of luminance (cd/m^2) and contrast (Weber ratio) measurements.

	Luminance (cd/m^2)		*Contrast*	
Day	Mean	St. Dev.	Mean	St. Dev.
CEVMS	2134	798.70	-0.20	0.53
Standard Billboard	3063	2730.92	0.03	0.32
Night				
CEVMS	56.44	16.61	69.70	59.18
Standard Billboard	8.00	5.10	6.56	3.99

Visual Complexity

As with Reading, the feature congestion measure was used to estimate the level of visual complexity/clutter in the DCZs. The analysis procedures were the same as for Reading.

Figure 31 shows the mean feature congestion measures for each of the advertising types (standard errors are included in the figure). Unlike the results for Reading, the selected off-premise advertising DCZs for Richmond differed in terms of mean feature congestion; $F(3, 36) = 3.95$, $p = 0.016$. Follow up t-tests with an alpha of 0.05 showed that the CEVMS DCZs on arterials had significantly lower feature congestion than all of the other off-premise advertising conditions. None of the remaining DCZs with off-premise advertising differed from each other. The selection of DCZs for the conditions with off-premise advertising took into account the type of road, the side of the road the target billboard was placed, and the perceived level of visual clutter. Based on the feature congestion measure, these results indicated that the conditions with off-premise advertising were not equated with respect to level of visual clutter.

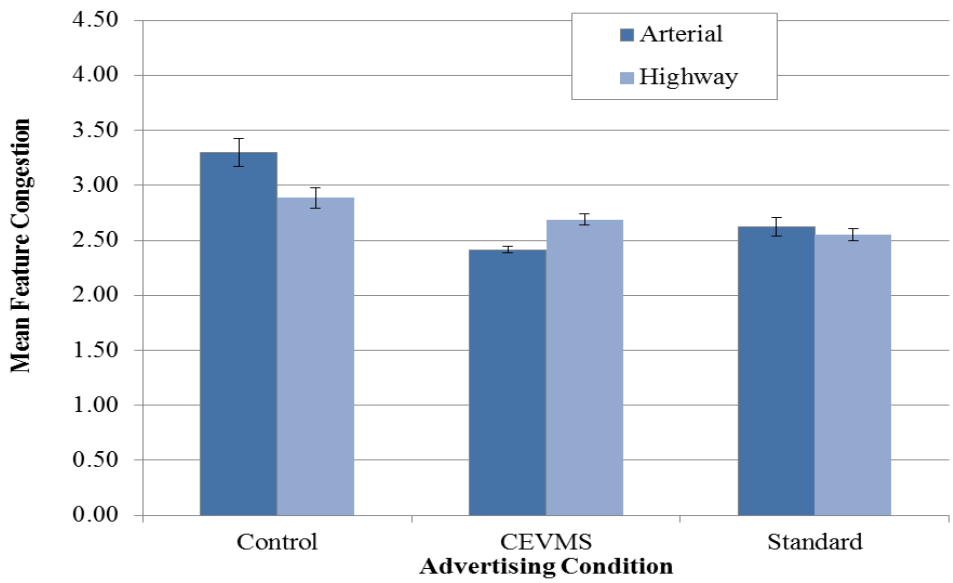

Figure 31. Mean feature congestion as a function of advertising condition and road type.

Effects of Billboards on Gazes to the Road Ahead

As was done for the data from Reading, GEE were used to analyze the probability of a participant gazing at the road ahead. A logistic regression model for repeated measures was generated by using a binomial response distribution and Logit link function. The resultant value was the probability of a participant gazing at the road ahead (as previously defined).

Time of day (day or night), road type (freeway or arterial), advertising type (CEVMS, standard billboard, or control), and all corresponding second-order interactions were explanatory variables in the logistic regression model. The interaction of advertising type by road type was statistically significant, $\chi^2(2) = 14.19$, $p < 0.001$. Table 9 shows the corresponding probability of gazing at the road ahead as a function of advertising condition and road type.

Table 9. The probability of gazing at the road ahead as a function of advertising condition and road type.

Advertising Condition	*Arterial*	*Freeway*
Control	0.78	0.92
CEVMS	0.76	0.82
Standard	0.81	0.85

Follow-up analyses for the interaction used Tukey-Kramer adjustments with an alpha level of 0.05. The freeway control had the greatest probability of gazing at the road ahead (M = 0.92). This probability differed significantly from the remaining five probabilities. On arterials, there were no significant differences among the probabilities of gazing at the road ahead among the three advertising conditions. On freeways, there was no significant difference between the probability associated with CEVMS DCZs and the probability associated with standard billboard DCZs.

Additional descriptive statistics were computed for the three advertising types to determine the probability of gazing at the ROIs that were defined in the panoramic scene. As was done with the data from Reading, some of the ROIs were combined for ease of analysis. Table 10 presents the probability of gazing at the different ROIs.

Table 10. Probability of gazing at ROIs for the three advertising conditions on arterials and freeways.

Road Type	*ROI*	*CEVMS*	*Standard Billboard*	*Control*
Arterial	*CEVMS*	0.06	N/A	N/A
	Left Side of Vehicle	0.03	0.05	0.04
	Road ahead	0.76	0.81	0.78
	Right Side of Vehicle	0.07	0.06	0.09
	Standard Billboard	N/A	0.02	N/A
	Participant Vehicle	0.07	0.06	0.09
Freeway	*CEVMS*	0.05	N/A	N/A
	Left Side of Vehicle	0.03	0.01	0.01
	Road ahead	0.82	0.85	0.92
	Right Side of Vehicle	0.04	0.04	0.03
	Standard Billboard	N/A	0.04	N/A
	Participant Vehicle	0.06	0.06	0.05

The probability of gazing away from the forward roadway ranged from 0.08 to 0.24. In particular, the probability of gazing toward a CEVMS was slightly greater on arterials (M = 0.06) than on freeways (M = 0.05). In contrast, the probability of gazing toward a standard billboard was greater on freeways (M = 0.04) than on arterials (M = 0.02). In both situations, the probability of gazing at the road ahead was greatest on freeways.

Fixations to CEVMS and Standard Billboards

About 2.5 percent of the fixations were to CEVMS. The mean fixation duration to a CEVMS was 371 ms and the maximum fixation duration was 1,335 ms. Figure 32 shows the distribution of fixation durations to CEVMS during the day and at night. In the daytime, the mean fixation duration to a CEVMS was 440 ms and at night it was 333 ms. Approximately 1.5 percent of the fixations were to standard billboards. The mean fixation duration to standard billboards was 318 ms and the maximum fixation duration was 801 ms. Figure 33 shows the distribution of fixation durations for standard billboards. The mean fixation duration to a standard billboard was 313 ms and 325 ms during the day and night, respectively. For comparison purposes, figure 34 shows the distribution of fixation durations to the road ahead during the day and night. In the daytime, the mean fixation duration to the road ahead was 378 ms and at night it was 358 ms.

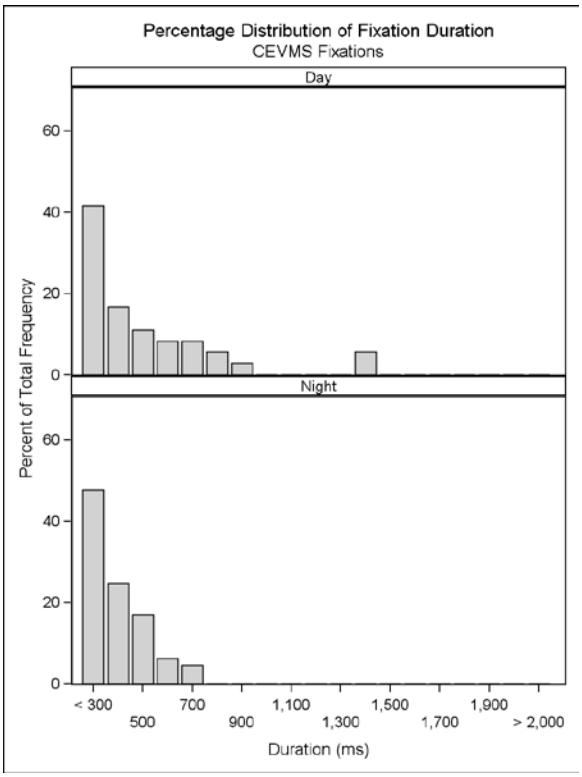

Figure 32. Fixation duration for CEVMS in the day and at night.

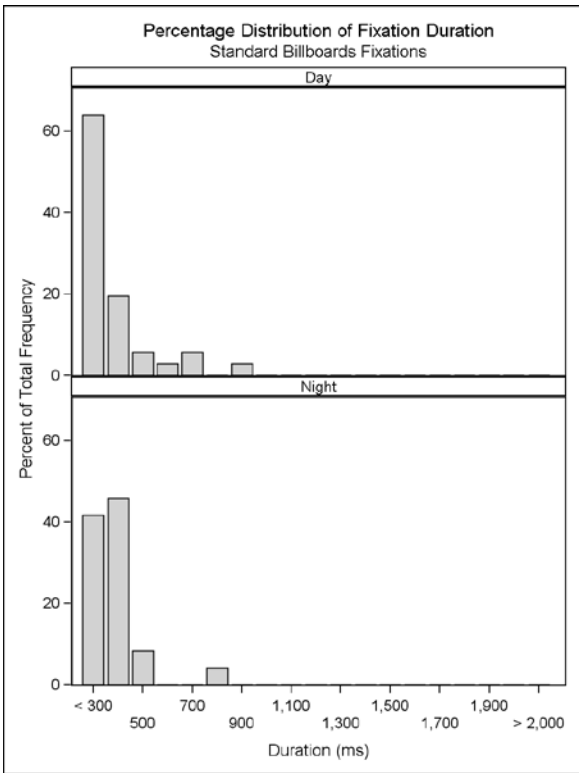

Figure 33. Fixation duration for standard billboards in the day and at night.

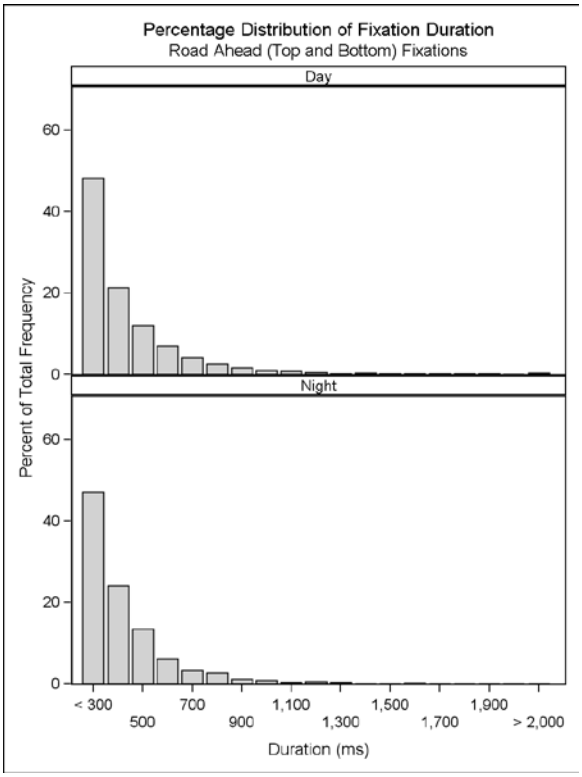

Figure 34. Fixation duration for the road ahead in the day and at night.

As was done with the data for Reading, the record of fixations was examined to determine dwell times to CEVMS and standard billboards. There were a total of 21 separate dwell times to CEVMS with a mean of 2.86 sequential fixations (minimum of 2 fixations and maximum of 6 fixations). The 21 dwell times came from 12 different participants and four different CEVMS. The mean dwell time duration to the CEVMS was 1,039 ms (minimum of 500 ms and maximum of 2,720 ms). There was one dwell time greater than 2,000 ms to CEVMS. To the standard billboards there were 13 separate dwell times with a mean of 2.31 sequential fixations (minimum of 2 fixations and maximum of 3 fixations). The 13 dwell times came from 11 different participants and four different standard billboards. The mean dwell time duration to the standard billboards was 687 ms (minimum of 450 ms and maximum of 1,152 ms). There were no dwell times greater than 2,000 ms to standard billboards.

In some cases several dwell times came from the same participant. To compute a statistic on the difference between dwell times for CEVMS and standard billboards, average dwell times were computed per participant for the CEVMS and standard billboard conditions. These average values were used in a *t*-test assuming unequal variances. The difference in average dwell time between CEVMS (M = 1,096 ms) and standard billboards (M= 674 ms) was statistically significant, $t(14) = 2.23$, $p = .043$.

Figure 35 through figure 37 show heat maps for the dwell-time durations to the CEVMS that were greater than 2,000 ms. The DCZ was on a freeway during the daytime. The CEVMS is located on the left side of the road (indicated by an orange rectangle). There were three fixations to this billboard, and the single fixations were between 651 ms and 1,335 ms. The dwell time for this billboard was 2,270 ms. Figure 35 shows the first fixation toward the CEVMS. There are no vehicles near the participant in his/her respective travel lane or adjacent lanes. In this situation, the billboard is relatively close to the road ahead ROI. Figure 36 shows a heat map later in the DCZ where the driver continues to look at the CEVMS. The heat map does not overlay the CEVMS in the picture since the heat map has integrated over time where the driver was gazing. The CEVMS has moved out of the area because of the vehicle moving down the road. However, visual inspection of the video and eye tracking statistics showed that the driver was fixating on the CEVMS. Figure 37 shows the end of the sequential fixations to the CEVMS. The driver returns to gaze directly in front of the vehicle. Once the CEVMS was out of the forward field of view, the driver quit looking at the billboard.

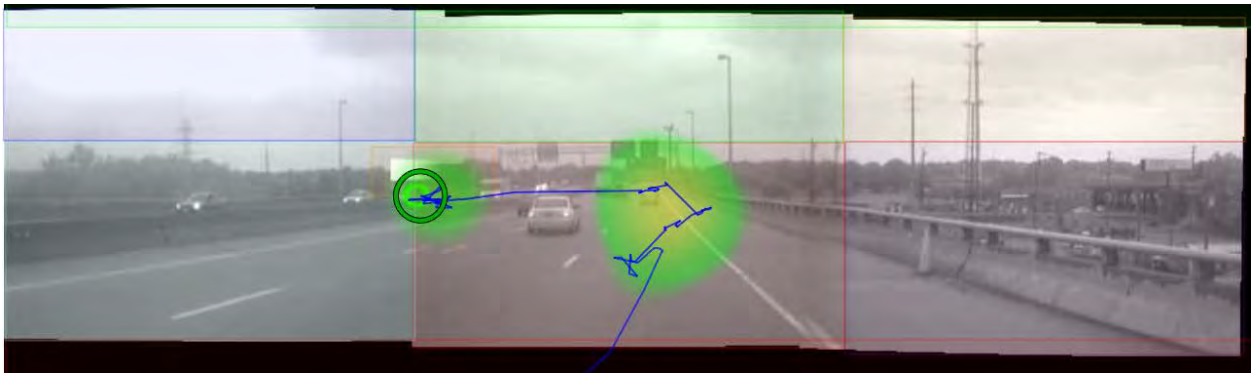

Figure 35. Heat map for first fixation to CEVMS with long dwell time.

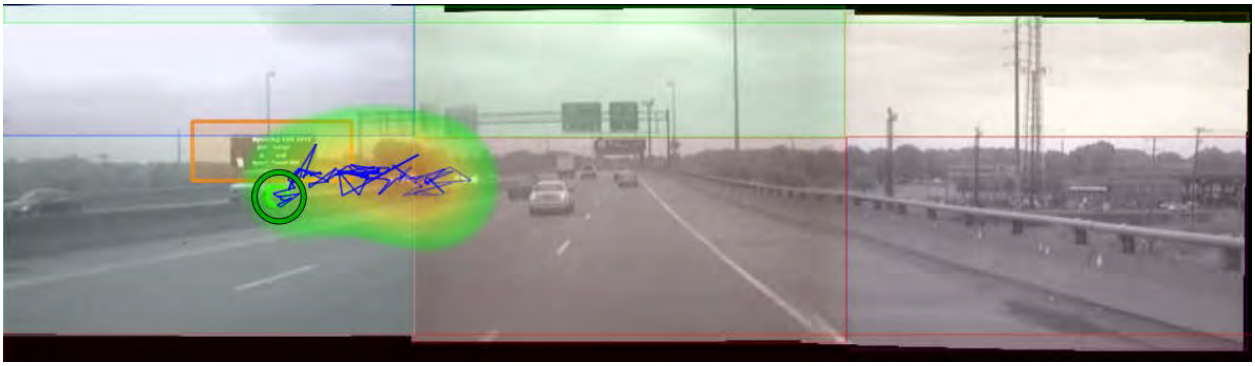

Figure 36. Heat map for later fixations to CEVMS with long dwell time.

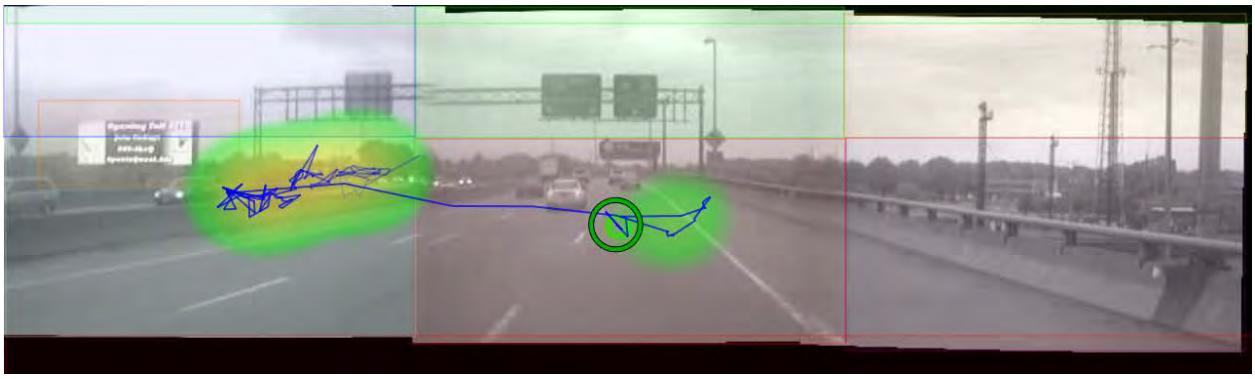

Figure 37. Heat map at end of fixations to CEVMS with long dwell time.

Comparison of Gazes to CEVMS and Standard Billboards

As was done for the data from Reading, GEE were used to analyze whether a participant gazed more toward CEVMS than toward standard billboards, given that the participant was looking at off-premise advertising. Recall that a sample probability greater than 0.5 indicated that participants gazed more toward CEVMS than standard billboards when the participants gazed at off-premise advertising. In contrast, if the sample probability was less than 0.5, participants showed a preference to gaze more toward standard billboards than CEVMS when directing visual attention to off-premise advertising.

Time of day (i.e., day or night), road type (i.e., freeway or arterial), and the corresponding interaction were explanatory variables in the logistic regression model. Time of day had a significant effect on participant gazes toward off-premise advertising, χ^2 (1) = 4.46, p = 0.035. Participants showed a preference to gaze more toward CEVMS than toward standard billboards during both times of day. During the day the preference was only slight (M = 0.52), but at night the preference was more pronounced (M = 0.71). Road type was also a significant predictor of where participants directed their gazes at off-premise advertising, χ^2 (1) = 3.96, p = 0.047. Participants gazed more toward CEVMS than toward standard billboards while driving on both types of roadways. However, driving on freeways yielded a slight preference for CEVMS over standard billboards (M = 0.55), but driving on arterials resulted in a larger preference in favor of CEVMS (M = 0.68).

Observation of Driver Behavior

No near misses or driver errors occurred.

Level of Service

Table 11 shows the level of service as a function of advertising type, type of road, and time of day. As expected, there was less congestion during the nighttime runs than in the daytime. In general, there was traffic during the data collection runs; however, the eye tracking data were recorded while the vehicles were in motion.

Table 11. Estimated level of service as a function of advertising condition, road type, and time of day.

	Arterial		Freeway	
	Day	Night	Day	Night
Control	B	A	C	B
CEVMS	B	A	B	A
Standard	C	A	C	C

DISCUSSION OF RICHMOND RESULTS

Overall the probability of looking at the forward roadway was high across all conditions and consistent with the findings from Reading and previous related research.[11,9,12] In this second study the CEVMS and standard billboard conditions did not differ from each other. For the DCZs on arterials there were no significant differences among the control, CEVMS, and standard billboard conditions. On the other hand, while the CEVMS and standard billboard conditions on the freeways did not differ from each other, they were significantly different from their respective control conditions. The control condition on the freeway principally had trees along the sides of the road and the signs that were present were freeway signs located in the road ahead ROI.

Measures such as feature congestion rated the three DCZs on freeways as not being statistically different from each other. These types of measures have been useful in predicting visual search and the effects of visual salience in laboratory tasks.[34] Models of visual salience may predict that, at least during the daytime, trees on the side of the road may be visually salient objects that would attract a driver's attention.[47] However, it appears that in the present study, participants principally kept their eyes on the road ahead.

The mean fixations to CEVMS, standard billboards, and the road ahead were found to be similar in magnitude with no long fixations. Examination of dwell times showed that there was one long dwell time for a CEVMS greater than 2,000 ms and it occurred in the daytime on a sign located on the left side of the road on a freeway DCZ. Furthermore, when averaging among participants the mean dwell time for CEVMS was significantly longer than to standard billboards, but still under 2,000 ms. For the dwell time greater than 2,000 ms, examination of the scene camera video and eye tracking heat maps showed that the driver was initially looking toward the forward roadway and made a first fixation to the sign. Three fixations were made to the sign and then the

driver started looking back to the road ahead as the sign moved out of the forward field of view. On the video there were no vehicles near the subject driver's own lane or in adjacent lanes.

Only the central 2 degrees of vision, foveal vision, provide resolution sharp enough for reading or recognizing fine detail.[57] However, useful information for reading can be extracted from parafoveal vision, which encompasses the central 10 degrees of vision.[57] More recent research on scene gist recognition[3] has shown that peripheral vision (beyond parafoveal vision) is more useful than central vision for recognizing the gist of a scene.[58] Scene gist recognition is a critically important early stage of scene perception, and influences more complex cognitive processes such as directing attention within a scene and facilitating object recognition, both of which are important in obtaining information while driving.

The results of this study do show one duration of eyes off the forward roadway greater than 2,000 ms, the duration at which Klauer et al. observed near-crash/crash risk at more than twice those of normal, baseline driving.[14,53] When looking at the tails of the fixation distributions, few fixations were greater than 1,000 ms, with the longest fixation being equal to 1,335 ms.[53,54] The one long dwell time on a CEVMS that was observed was a rare event in this study, and review of the video and eye tracking data suggests that the driver was effectively managing acquisition of visual information while driving and fixated on the advertising. However, additional work needs to be done to derive criteria for gazing or fixating away from the forward road view where the road scene is still visible in peripheral vision.

The results showed that drivers are more likely to look at CEVMS than standard billboards during the nighttime across the conditions tested (at night the average probability of gazing at CEVMS was M= 0.71). CEVMS do have greater luminance than standard billboards at night and also have higher contrast. The CEVMS have the capability of being lit up so that they would appear as very bright signs to drivers (for example, up to about10,000 cd/m^2 for a white square on the sign.). However, our measurements of these signs showed an average luminance of about 56 cd/m^2. These signs would be conspicuous in a nighttime driving environment but significantly less so than other light sources such as vehicle headlights. Drivers were also more likely to look at CEVMS than standard billboards on both arterials and freeways, with a higher probability of gazes on arterials.

In this second study, CEVMS and standard billboards were more nearly equated with respect to setback from the road. Gazes to the road ahead were not significantly different between CEVMS and standard billboard DCZs across conditions and the proportion of gazes to the road ahead were consistent with previous research. One long dwell time for a CEVMS was observed in this study; however, it occurred in the daytime where the luminance and contrast (affecting the perceived brightness) of these signs are similar to those for standard billboards.

[3] "Scene gist recognition" refers to the element of human cognition that enables us to determine the meaning of a scene and categorize it by type (e.g., a beach, an office) almost immediately upon seeing it.

GENERAL DISCUSSION

This study was conducted to investigate the effect of CEVMS on driver visual behavior in a roadway driving environment. An instrumented vehicle with an eye tracking system was used. Roads containing CEVMS, standard billboards, and control areas with no off-premise advertising were selected. The CEVMS and standard billboards were measured with respect to luminance, location, size, and other relevant variables to characterize these visual stimuli. Unlike previous studies on digital billboards, the present study examined CEVMS as deployed in two United States cities and did not contain dynamic video or other dynamic elements. The CEVMS changed content approximately every 8 to 10 seconds, consistent within the limits provided by FHWA guidance.[2] In addition, the eye tracking system used had nearly a 2-degree level of resolution that provided significantly more accuracy in determining what objects the drivers were gazing or fixating on as compared to some previous field studies examining CEVMS.

CONCLUSIONS

Do CEVMS attract drivers' attention away from the forward roadway and other driving relevant stimuli?

Overall, the probability of looking at the road ahead was high across all conditions. In Reading, the CEVMS condition had a lower proportion of gazes to the road ahead than the standard billboard condition on the freeways. Both of the off-premise advertising conditions had a lower proportion of gazes to the road ahead than the control condition on the freeway. The lower proportion of gazes to the road ahead can be attributed to the overall distribution of gazes away from the road ahead and not just to the CEVMS. On the other hand, for the arterials the CEVMS and standard billboard conditions did not differ from each other, but both had a lower proportion of gazes to the road ahead compared to the control. In Richmond there were no differences among the three advertising conditions on the arterials. However, for the freeways the CEVMS and standard billboard conditions did not differ from each other but had a lower proportion of gazes to the road ahead than the control.

The control conditions differed across studies. In Reading, the control condition on arterials showed 92 percent for gazing at the road ahead while on the freeway it was 86 percent. On the other hand, in Richmond the control condition for arterials was 78 percent and for the freeway it was 92 percent. The control conditions on the freeway differed across the two studies. In Reading there were businesses off to the side of the road; whereas in Richmond the sides of the road were mostly covered with trees. The control conditions on the arterials also differed across cities in that both contained businesses and on-premise advertising; however, in Reading arterials had four lanes and in Richmond arterials had six lanes. The reason for these differences across cities was that these control conditions were selected to match the other conditions (CEVMS and standard billboards) that the drivers would experience in the two respective cities. Also, the selection of DCZs was obviously constrained by what was available on the ground in these cities.

The results for the off-premise advertising conditions are consistent with Lee et al., who observed that 76 percent of drivers' time was spent looking at the road ahead in the CEVMS scenario and 75 percent in the standard billboard scenario.[9] However, it should be kept in mind

that drivers did gaze away from the road ahead even when no off-premise advertising was present and that the presence of clutter or salient visual stimuli did not necessarily control where drivers gazed.

Do glances to CEVMS occur that would suggest a decrease in safety?

In DCZs containing CEVMS, about 2.5 percent of the fixations were to CEVMS (about 2.4 percent to standard billboards). The results for fixations are similar to those reported in other field data collection efforts that included advertising signs.[12,11,9,13] Fixations greater than 2,000 ms were not observed for CEVMS or standards billboards.

However, an analysis of dwell times to CEVMS showed a mean dwell time of 994 ms (maximum of 1,467 ms) for Reading and a mean of 1,039 ms (maximum of 2,270 ms) for Richmond. Statistical comparisons of average dwell times between CEVMS and standard billboards were not significant in Reading; however, in Richmond the average dwell times to CEVMS were significantly longer than to standard billboards, though below 2,000 ms. There was one dwell time greater than 2,000 ms to a CEVMS across the two cities. On the other hand, for standard billboards there were three long dwell times in Reading; there were no long dwell times to these billboards in Richmond. Review of the video data for these four long dwell times showed that the signs were not far from the forward view when participants were fixating. Therefore, the drivers still had access to information about what was in front of them through peripheral vision.

As the analyses of gazes to the road ahead showed, drivers distributed their gazes away from the road ahead even when there were no off-premise billboards present. Also, drivers gazed and fixated on off-premise signs even though they were generally irrelevant to the driving task. However, the results did not provide evidence indicating that CEVMS were associated with long glances away from the road that may reflect an increase in risk. When long dwell times occurred to CEVMS or standard billboards, the road ahead was still in the driver's field of view.

Do drivers look at CEVMS more than at standard billboards?

The drivers were generally more likely to gaze at CEVMS than at standard billboards. However, there was some variability between the two locations and between type of roadway (arterial or freeway). In Reading, the participants looked more often at CEVMS when on arterials, whereas they looked more often at standard billboards when on freeways. In Richmond, the drivers looked at CEVMS more than standard billboards no matter the type of road they were on, but as in Reading the preference for gazing at CEVMS was greater on arterials (68 percent on arterials and 55 percent on freeways). The slower speed on arterials and sign placement may present drivers with more opportunities to gaze at the signs.

In Richmond, the results showed that drivers gazed more at CEVMS than standard billboards at night; however, for Reading no effect for time of day was found. CEVMS do have higher luminance and contrast than standard billboards at night. The results showed mean luminance of about 56 cd/m^2 in the two cities where testing was conducted. These signs would appear clearly visible but not overly bright.

SUMMARY

The results of these studies are consistent with a wealth of research that has been conducted on vision in natural environments.[26,22,21] In the driving environment, gaze allocation is principally controlled by the requirements of the task. Consistent results were shown for the proportion of gazes to the road ahead for off-premise advertising conditions across the two cities. Average fixations were similar to CEVMS and standard billboards with no long single fixations evident for either condition. Across the two cities, four long dwell times were observed: one to a CEVMS on a freeway in the day, two to the same standard billboard on a freeway (once at night and once in the daytime), and one to a standard billboard on an arterial at night. Examination of the scene video and eye tracking data indicated that these long dwell times occurred when the billboards were close to the forward field of view where peripheral vision could still be used to gather visual information on the forward roadway.

The present data suggest that the drivers in this study directed the majority of their visual attention to areas of the roadway that were relevant to the task at hand (i.e., the driving task). Furthermore, it is possible, and likely, that in the time that the drivers looked away from the forward roadway, they may have elected to glance at other objects in the surrounding environment (in the absence of billboards) that were not relevant to the driving task. When billboards were present, the drivers in this study sometimes looked at them, but not such that overall attention to the forward roadway decreased.

LIMITATIONS OF THE RESEARCH

In this study the participants drove a research vehicle with two experimenters on board. The participants were provided with audio turn-by-turn directions and consequently did not have a taxing navigation task to perform. The participants were instructed to drive as they normally would. However, the presence of researchers in the vehicle and the nature of the driving task do limit the degree to which one may generalize the current results to other driving situations. This is a general limitation of instrumented vehicle research.

The two cities employed in the study appeared to follow common practices with respect to the content change frequency (every 8 to 10 seconds) and the brightness of the CEVMS. The current results would not generalize to situations where these guidelines are not being followed.

Participant recruiting was done through libraries, community centers and at a university. This recruiting procedure resulted in a participant demographic distribution that may not be representative of the general driving population.

The study employed a head-free eye tracking device to increase the realism of the driving situation (no head-mounted gear). However, the eye tracker had a sampling rate of 60 Hz, which made determining saccades problematic. The eye tracker and analyses software employed in this effort represents a significant improvement in technology over previous similar efforts in this area.

The study focused on objects that were 1,000 feet or less from the drivers. This was dictated by the accuracy of the eye tracking system and the ability to resolve objects for data reduction. In addition, the geometry of the roadway precluded the consideration of objects at great distances.

The study was performed on actual roadways, and this limited the control of the visual scenes except via the route selection process. In an ideal case, one would have had roadways with CEVMS, standard billboards, and no off-premise advertising and in which the context surrounding digital and standard billboards did not differ. This was not the case in this study, although such an exclusive environment would be inconsistent with the experience of most drivers. This presents issues with the interpretation of the specific contributions made by billboards and the environment to the driver's behavior.

Sign content was not investigated (or controlled) in the present study, but may be an important factor to consider in future studies that investigate the distraction potential of advertising signs. Investigations about the effect of content could potentially be performed in driving simulators where this variable could be systematically controlled and manipulated.

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Laws, Regs and Policy Guidance

Guidance On Off-Premise Changeable Message Signs

Contacts

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U.S. Department of Transportation **Federal Highway Administration**	**Memorandum**

Subject:	**INFORMATION**: Guidance On Off-Premise Changeable Message Signs	Date:	September 25, 2007
	ORIGINAL SIGNED BY: Gloria M. Shepherd		
From:	Gloria M. Shepherd Associate Administrator for Planning, Environment, and Realty	Reply to	HEPR-20
To:	Division Administrators ATTN: Division Realty Professionals		

Purpose

The purpose of this memorandum is to provide guidance to Division Realty Professionals concerning off-premises changeable message signs adjacent to routes subject to requirements for effective control under the Highway Beautification Act (HBA) codified at 23 U.S.C. 131. It clarifies the application of the Federal Highway Administration (FHWA) July 17, 1996, memorandum on this subject. This office may provide further guidance in the future as a result of additional information received through safety research, stakeholder input, and other sources.

Pursuant to 23 CFR 750.705, a State DOT is required to obtain the FHWA Division approval of any changes to its laws, regulations, and procedures to implement the requirements of its outdoor advertising control program. A State DOT should request and the Division offices should provide a determination as to whether the State should allow off-premises changeable Electronic Variable Message Signs (CEVMS) adjacent to controlled routes, as required by our delegation of responsibilities under 23 CFR 750.705(j). The Divisions that already have formally approved CEVMS use on HBA controlled routes, as well as, those that have not yet issued a decision, should

re-evaluate their position in light of the following considerations. The decision of the Division should be based upon a review and approval of a State's affirmation and policy that: (1) is consistent with the existing Federal/State Agreement (FSA) for the particular State, and (2) includes but is not limited to consideration of requirements associated with the duration of message, transition time, brightness, spacing, and location, submitted for the FHWA approval, that evidence reasonable and safe standards to regulate such signs are in place for the protection of the motoring public. **Proposed laws, regulations, and procedures that would allow permitting CEVMS subject to acceptable criteria (as described below) do not violate a prohibition against "intermittent" or "flashing" or "moving" lights as those terms are used in the various FSAs that have been entered into during the 1960s and 1970s.**

This guidance is applicable to conforming signs, as applying updated technology to nonconforming signs would be considered a substantial change and inconsistent with the requirements of 23 CFR 750.707(d)(5). As noted below, all of the requirements in the HBA and its implementing regulations, and the specific provisions of the FSAs, continue to apply.

Background

The HBA requires States to maintain *effective control* of outdoor advertising adjacent to certain controlled routes. The reasonable, orderly and effective display of outdoor advertising is permitted in zoned or unzoned commercial or industrial areas. Signs displays and devices whose *size, lighting and spacing are consistent with customary use determined by agreement between the several States and the Secretary*, may be erected and maintained in these areas (23 U.S.C. § 131(d)). Most of these agreements between the States and the Secretary that determined the size, lighting and spacing of conforming signs were signed in the late 1960's and the early 1970's.

On July 17, 1996, the Office of Real Estate Services issued a memorandum to Regional Administrators to provide guidance on off-premise changeable message signs and confirmed that the FHWA has *"always applied the Federal law 23 U.S.C. 131 as it is interpreted and implemented under the Federal regulations and individual FSAs."* It was expressly noted that "*in the twenty-odd years since the agreements have been signed, there have been many technological changes in signs, including changes that were unforeseen at the time the agreements were executed. While most of the agreements have not changed, the changes in technology require the State and the FHWA to interpret the agreements with those changes in mind.*" The July 17, 1996, memorandum primarily addressed tri-vision signs, which were the leading technology at the time, but it specifically noted that changeable message signs *"regardless of the type of technology used"* are permitted if the interpretation of the FSA allowed them. Further advances in technology and affordability of LED and other complex electronic message signs, unanticipated at the time the FSAs were entered into, require the FHWA to confirm and expand on the principles set forth in the July 17, 1996, memorandum.

The policy espoused in the July 17, 1996, memorandum was premised upon the concept that changeable messages that were fixed for a reasonable time period do not constitute a moving sign. If the State set a reasonable time period, the agreed-upon prohibition against moving signs is not violated. Electronic signs that have stationary messages for a reasonably fixed time merit the same considerations.

Discussion

Changeable message signs, including Digital/LED Display CEVMS, are acceptable for

conforming off-premise signs, if found to be consistent with the FSA and with acceptable and approved State regulations, policies and procedures.

This guidance does not prohibit States from adopting more restrictive requirements for permitting CEVMS to the extent those requirements are not inconsistent with the HBA, Federal regulations, and existing FSAs. Similarly, Divisions are not required to concur with State proposed regulations, policies, and procedures if the Division review determines, based upon all relevant information, that the proposed regulations, policies and procedures are not consistent with the FSA or do not include adequate standards to address the safety of the motoring public. If the Division Office has any question that the FSA is being fully complied with, this should be discussed with the State and a process to change the FSA may be considered and completed before such CEVMS may be allowed on HBA controlled routes. The Office of Real Estate Services is available to discuss this process with the Division, if requested.

If the Division accepts the State's assertions that their FSA permits CEVMS, in reviewing State-proposed regulations, policy and procedures for acceptability, the Divisions should consider all relevant information, including, but not limited to duration of message, transition time, brightness, spacing, and location, to ensure that they are consistent with their FSA and that there are adequate standards to address safety for the motoring public. The Divisions should also confirm that the State provided for appropriate public input, consistent with applicable State law and requirements, in its interpretation of the terms of their FSA as allowing CEVMS in accordance with their proposed regulations, policies, and procedures.

Based upon contacts with all Divisions, we have identified certain ranges of acceptability that have been adopted in those States that do allow CEVMS that will be useful in reviewing State proposals on this topic. Available information indicates that State regulations, policy and procedures that have been approved by the Divisions to date, contain some or all of the following standards:

- Duration of Message
  - Duration of each display is generally between 4 and 10 seconds - 8 seconds is recommended.
- Transition Time
  - Transition between messages is generally between 1 and 4 seconds - 1-2 seconds is recommended.
- Brightness
  - Adjust brightness in response to changes in light levels so that the signs are not unreasonably bright for the safety of the motoring public.
- Spacing
  - Spacing between such signs not less than minimum spacing requirements for signs under the FSA, or greater if determined appropriate to ensure the safety of the motoring public.
- Locations
  - Locations where allowed for signs under the FSA except such locations where determined inappropriate to ensure safety of the motoring public.

Other standards that the States have found helpful to ensure driver safety include a default designed to freeze a display in one still position if a malfunction occurs; a process for modifying displays and lighting levels where directed by the State DOT to assure safety of the motoring public; and requirements that a display contain static

messages without movement such as animation, flashing, scrolling, intermittent or full-motion video.

Conclusion

This guidance is intended to provide information to assist the Divisions in evaluating proposals and to achieve national consistency given the variations in FSAs, State law, and State regulations, policies and procedures. It is not intended to amend applicable legal requirements. Divisions are strongly encouraged to work with their State in its review of their existing FSAs and, if appropriate, assist in pursuing amendments to address proposed changes relating to CEVMS or other matters. In this regard, the Office of Realty Estate Services is currently reviewing the process for amending FSAs, as established in 1980, to determine appropriate revisions to streamline requirements while continuing to ensure there is adequate opportunity for public involvement.

For further information on guidance on *Off-Premise Changeable Message Signs*, you may contact the Office of Real Estate Services' "Point of Contact" serving your Division or the contact on this page.

Updated: 09/05/2014

The Regulation of Signage: Guidelines for Local Regulation of Digital On-Premise Signs

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Introduction

Advancements in technology and their application to signage have been a constant in the evolution of signs, their design, and their role in defining physical places. Parallel to this, with each successive application of new technology to new signs – internal/external lighting, backlit awnings, and currently digital sign technology or electronic message centers -- local governments have found themselves unable to understand the new sign technology or the specifics of how to regulate the new types of signs it allowed. Eventually, during the first phase of the use of new technologies, sign regulations are amended to impose various restrictions on the new type of signs. During subsequent phases, a more balanced picture emerges because more knowledge about the new technology becomes available, the sign industry provides more options and technical specifications to address community concerns and meet statutory standards, and local governments gain experience with regulating these new signs,.

Perhaps there are no better places that illustrate the evolution in sign design, specifically lighting and graphics, and the integration of new sign technology in a concentrated district than Times Square in New York City and "The Strip" in Las Vegas. Even though these districts do not resemble the typical American commercial strip, their current visual character is the result of the evolution of new technology in the design of signage and its use in a very defined space.

In the 1890's, the introduction of incandescent light bulbs made the electrification of Broadway possible and began to give a new aesthetic to New York's theater district and Times Square. The first electrically-illuminated sign appeared in Times Square 1892 and was an advertisement for a Coney Island resort. Signs illuminated with light bulbs replaced the previous hand painted wooden billboards that

were primarily textual in nature, similar to signs that are the average preference for Main Street-type historic places. Times Square became known as "The Great White Way" due to its saturation of electric billboards and signs in theater marquees, restaurants, and shops. There were many negative reactions to the use of this new technology that added colorful lighting displays to the content of building signs and billboards. The concentration of specific land uses, the theaters, and the location of the square were driving the continuous need for exciting signs. New advances in technology fed the need for inventing new creative graphics. Gradually, the current character of Times Square emerged, but each time technology made it possible to invent a new sign, opposition by New Yorkers resulted in regulatory responses. Finally, in 1987, a comprehensive signage ordinance was enacted to regulate billboards on buildings.

Today, Times Square and the Las Vegas "Strip" contain some of the world's largest signs and the new technology of Electronic Message Centers is defining a new era of exciting graphics, messaging, and place definition making these two districts unlike any other place in the world. With the collaboration of the sign industry, the businesses, the regulators and the elected officials, both Times Square and "The Strip" have evolved into unique districts with a distinctive character.

But how much of this new sign technology can – or should be – adapted to the rest of the country -- to "Mainstreet USA"? And, what are the appropriate regulatory options for local governments to consider when businesses and sign companies seek to introduce this technology in their communities? These questions are the focus of this session.

New Technology

Currently, the concern with the applications and regulation of on-premise digital sign technology is in its initial phase, marked by confusion among the planning and zoning community both as to how these signs work and how they can and should be regulated. Further adding to the confusion is the fact that the technology is evolving rapidly, offering exciting possibilities for new types of sign displays in exterior and interior environments. For example, during the opening ceremonies of the 2008

Beijing Olympics, the floor of the stadium was equipped with a 3000 sq m video digital screen that used very similar type LED technology.

Technically, digital signs are a more complex and graphically versatile technology than what planners are used to: internally or externally illuminated signs that present a fixed message. Rather than using incandescent lamps or fluorescent tubes as a light source, digital signs use light-emitting diodes (LEDs), a semiconductor-based light source. LEDs transmit across the visible, ultraviolet and infrared wavelengths, and can generate very bright colors. According to Wikipedia, when a light-emitting diode is forward biased (switched on), electrons are able to recombine with holes within the device, releasing energy in the form of photons. This effect is called electroluminescence and the color of the light (corresponding to the energy of the photon) is determined by the energy gap of the semiconductor. An LED is usually small in area (less than 1 mm^2), and integrated optical components are used to shape its radiation pattern and assist in reflection.

Key Issues with LED Signage

Digital sign manufacturers operate at the national level and that makes it difficult for local planners to have direct access to the technology before an application for a sign permit is made through a local sign company. In addition, there are no national standards for the production of digital signs; however, the sign industry, through the International Sign Association, is working with various states to develop such standards. In short, digital signs present planners with the question of how to regulate a type of sign that uses a new technology and is dynamic, rather than the static signs to which they are accustomed ... and there is little guidance to answer that question. Thus, local government is asked to issue a permit for something it does not understand.

Assuming the local government does not have any regulations that are specific for digital sign technology, what does it do? Usually it will copy another community's requirements. But how were those regulations developed? Most local governments have limited experience with LED signs, mainly from electronic billboards on highways, a small number of electronic message centers signs in commercial areas, and signs embedded in the monument signs of houses of worship and administration

buildings. In fact, most of the reaction to digital signs from APA and other groups is focused on the off-premise digital billboards with many studies looking at the issue of driver's safety when reading the bright and changeable billboard messages. Research by the Federal Highway Administration and the Transportation Research Board has been examining digital signs along highways. In addition, APA has reviewed a few communities that have enacted amendments to their sign codes to address digital signs, mainly focusing on digital billboards. These studies do not directly help the local planner and zoning regulator with the enactment of local regulations to manage on-premise LED-based signs. Specific knowledge from research of commercial environments at the local level where digital signs will need to be incorporated into the existing signs and visual character is not yet available. That said, the International Sign Association has been funding research to address key aspects of digital signs and is working with the States to develop standards.

Electronic Message Center Sign Luminance

An important question is: What level of digital sign brightness is acceptable at night? Many local sign ordinances include standards and guidelines for commercial signs that employ a variety of light source types (fluorescent, neon, incandescent and high intensity discharge such as mercury, metal halide or high pressure sodium). These signs have a fixed message. The lamps inside the sign illuminate letters or symbols that do not have the ability to change what is displayed on the sign: a graphic that was approved by the building/zoning department. In these signs, the only change possible is through switching on or off or dimming certain parts of the sign.

Digital signs, on the other hand, use LEDs and the sign face consists of a multitude of closely spaced dots of pixels or light elements similar to a television screen. These signs are controlled by a computer and their message can change and be displayed as a colored image on the sign's face. As a result, the brightness of the displayed image changes according to the program that drives it and the sign can produce varying levels of luminance. Consequently, the regulation of lighting limits will depend on the signage graphic display program, its location within an environmental zone (*i.e.* dense urban areas where there is much electric light as opposed to 'darker'

suburban and exurban areas), the size of the sign, and the distance from which it is seen.

At present, most communities that regulate the luminance of on-premise digital signs have merely copied the standards that have been previously applied to digital billboards. Typically, these currently call for a maximum luminance of 5000 nits during daylight hours and 500 nits at night; however, the daylight luminance will likely be increasing to 7,500 nits based on discussions between the off-premise industry and the federal government.

Methodologies are being developed that will allow to compute new maximum levels of luminance depending on the factors explained, and their placement and proximity to residential areas.

Changing Display Message and/or Image

The programmable change of messages and/or images in a combination with vivid colors and graphics makes digital signs unique. Digital signs have the ability to accommodate any changing display pattern through the computer program that drives them and turn on and off color and brightness to compose new images. Static signs do not change their message and/or image. Most sign ordinances do not permit flashing signs or 'light movement' on the sign. A key question with digital signs is: Should the number of changes in the display be regulated? If yes, how do we establish a practical and defensible number? What should the time interval (in seconds) be between each successive display frame? Currently, there are no unified standards among the local sign ordinances that have been amended to accommodate digital signs. Of the ordinances sampled/referenced, most have considered the research done for billboards and have focused on driver distraction from changing messages. Approaches range from a complete ban on digitally changing graphics to the use of arbitrary guidelines and standards. Currently, many communities have adopted an 8 second static image requirement derived from an interim guidance recommendation issued by the federal government that governs off premise advertising signs/ billboards.

. However, as was pointed out, local commercial areas where on-premise signs are installed and are regulated are different than highways where off-premise billboards are located.

Digital Display Sign Size, Height, and Placement

Sign size and height have been key considerations of sign regulations. Almost all existing sign regulations have provisions for sign size that arbitrarily set total sign area without considering driving speeds, the driver's cone of vision, the sight distance needed to read a sign, or reaction time after the sign is read to make a decision to turn. The United States Sign Council has conducted considerable research on these issues and has developed standards and guidelines to address them effectively. In addition the Council has developed guidelines to be used to determine size of lettering so that it can be detected by the driver. On-premise digital signs need to be regulated on the basis of the standards and guidelines developed by the United States Sign Council and we will provide recommendations on how to address these and other issues with regard to the regulation of on-premise digital signs discussed during this session.

Current Practice

Based on a recent survey of numerous jurisdictions by one of the authors, the most common regulatory provisions applicable to digital on-premise signs appear below:

- Require that the sign display remain static for a minimum of 5- 8 seconds and require "instantaneous" change of the display; *i.e.*, no "fading" in/out of the message.
- Prohibit scrolling and animation outside of unique – and mostly pedestrian-oriented – locations.
- Limit brightness to 5,000 nits during daylight and 500 nits at night.
- Require automatic brightness control keyed to ambient light levels.
- Require display to go dark if there is a malfunction.
- Specify distancing requirements from areas zoned for residential use and/or prohibit orientation of s sign face towards an area zoned for residential use.

Opportunities for the Use of LED On-Premise Signage in the Local Commercial District

At the local commercial district or arterial strip the character of the environment and the driving speed are different than the highway where billboards are mostly located. The regulation of billboards at the local commercial districts varies from State to State and it is not really relevant to the regulation of on-premise signs. A typical commercial area already has many signs dispersed throughout a very loose mix of mostly freestanding buildings, parking lots, and utility poles and wires. Its character, including signage, evolved over a long period of time. The focus on the new technology and signs cannot ignore the existing spatial arrangements and the relationship with existing signs. Regulations will need to be applied in concert with the total environment, not by isolating these new signs. If planners were to apply a comprehensive approach to the management of signage, regulations for on-premise digital signs will be more effective and can also provide a way to 'visually decongest' existing strip commercial areas from ill-placed and ineffective signs.

Planners also need to consider differing approaches to digital signs for different types of zoning districts. What may be appropriate in a regional commercial district may well be "too little" signage for a downtown entertainment or sports arena district and "too much" for a neighborhood commercial district. In this regard, planners may want to consider using the "character areas" approach of the SFI Model Sign Code as a guide to the development of digital sign regulations that are tailored to specific zoning districts, as suggested below.

Character Area	Motion Limitation	Size Limitation		Could Apply to Part of Character Area
		EMCs as a Maximum % of the Total Sign Area Permitted on the Site	EMCs as a Maximum % of a Single Sign	
Downtown	8 seconds to Unlimited	30% to 100%	100%	Yes
Small Commercial - Suburban	8 seconds	30% to 50%	67%	No
General Commercial	8 seconds to Unlimited	30 % to 50%	80%	Yes
Highway Commercial (1)	8 seconds	30 % to 50%	80% to 100%	No
Mixed Use	8 seconds to 1 second	15% to 30%	50% to 80%	No
Offices	8 seconds to 1 second	15% to 30%	50% to 67%	No (2)
Industrial	8 seconds to Unlimited	30% to 50%	50% to 80%	No (2)

(1) Assumes that Highway Commercial is a relatively small geographic area focused at a highway interchange
(2) Harder to make distinctions among various locations in the office and industrial zone.

Illuminating the Issues

Digital Signage and Philadelphia's Green Future

by Gregory Young

In the world of outdoor advertising, successive technological and stylistic advancements have prompted cities and states to rethink their signage regulation and policy. There has been much controversy regarding the potential safety hazard posed by digital signage. Many studies show that such signage can lead to driver distraction and traffic delays (Wachtel, 2009). This research, and the resultant outcry from activists and concerned citizens, has led some policymakers to regulate distracting, electronic signage displays. There has been relatively little research, however, regarding the environmental and energy-consumption issues raised by this new technology.

The Basics of Digital Signage and Energy Consumption

First, *what exactly is digital signage*? Digital signage packages consist of three key pieces: player, extender(s), and display. The player is essentially a computer, equipped with software to generate the displayed content. Players are typically mounted behind the screen, and must be kept cool (via internal or accessory fan) and must be easily accessible for repairs or rebooting. These player/fan arrangements typically consume between 200 and 300 Watts[1] while running, slightly more than a home dishwasher. Depending on the relative location of the player to the screen, there may be a need for a video extender, essentially a cable which connects the player to the screen. This brings us to the most important component of any digital sign: the screen, or, in industry parlance, "the display." There are three main categories of digital display: LCD, plasma, and LED.

[1] **Watt**—a unit of power which measures the rate of energy conversion. It is defined as one joule per second. The kilowatt (kW) is equal to one thousand watts. For a sense of perspective, one kilowatt of power is approximately equal to 1.34 horsepower. A small electric heater with one heating element can use 1.0 kilowatt. If that heater is used for one hour, it will have used one kilowatt hour.

LED is the name used for Light Emitting Diode (aka LED) boards, commonly used in small to medium sized on-premise electronic advertising[2]. They are the overwhelming preference for large off-premise[3] digital billboards; designed for long-distance impact, they are often up to 1200 sq. ft. in size (20'x60'). According to the U.S. Department of Energy, LEDs produce more light (in lumens per watt) than incandescent bulbs, and their efficiency is not affected by shape and size, unlike traditional fluorescent light bulbs or tubes. Proponents of digital signage tout the "greenness" of LEDs; lower wattage and greater luminance[4] than the more traditional fluorescent, incandescent, or halogen bulbs.

State Rd. & Academy Rd., Philadelphia
Off-premise LED sign

These claims overlook one key bit of common sense: whereas traditional, static signage is illuminated by two or three "inefficient" lamps at nighttime, digital signs are comprised of hundreds, if not thousands, of "green" LED bulbs, each using between 2-10 watts, lit twenty-four hours a day. For instance, a 14'x48' LED billboard can have between 900 and 10,000 diodes.

3051 Front St., Philadelphia
Off-premise LED sign

Considering this simple fact, intrinsic to digital billboard design, it is no surprise that overall energy consumption of digital signage exceeds that of static signage, and makes bulb-to-bulb comparisons irrelevant in this context.

Additionally, with all digital display types, the players which control the changeable images and the fans required to cool them must be taken into account, as they too increase energy consumption. Adding auxiliary equipment, such as extenders, further increases the power demand.

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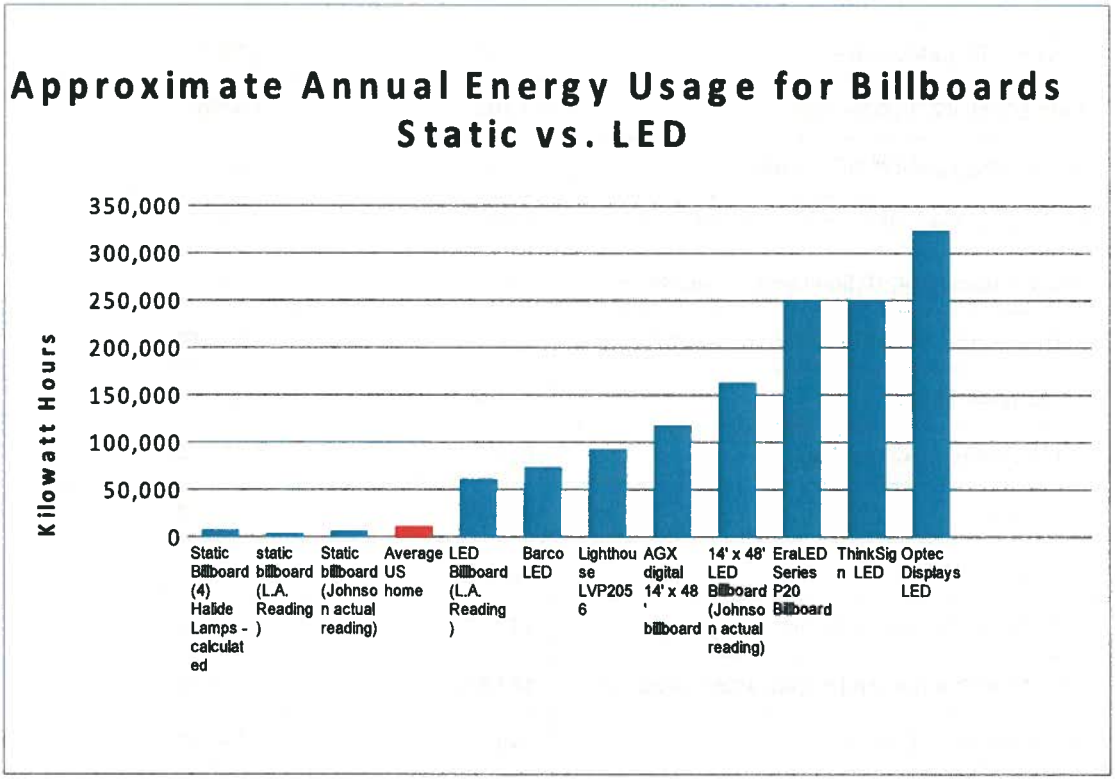
[2] **On-premise** or **accessory** signage is defined as a business establishment's on-site advertisements.

[3] **Off-premise** or **non-accessory** billboards/signs are those which advertise a business or product not sold at the signs' location. Roadside billboards are a popular form of off-premise advertising.

[4] **Luminance** is a measure of the perceived brightness of a light-emitting surface, such as a digital sign. Its unit of measure is candela per square meter (c/m^2), informally referred to as "nits."

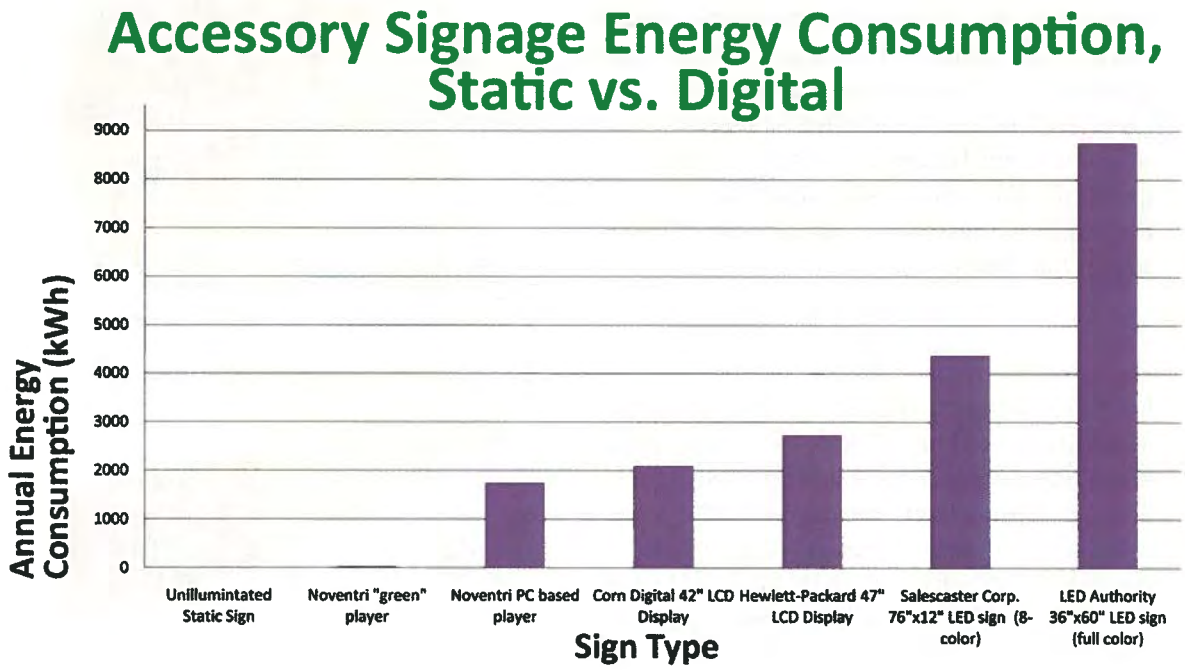
Determining the exact power consumption for a digital billboard is difficult; usage is dependent upon many variables, including size, resolution (how close pixels are spaced, aka diode density), how many LEDs are in each pixel, the color capabilities of the board (tri-color or full color), the image being displayed and time of day (daytime operation requires more power than nighttime operation, as the lit image must compete with the brightness of the sun). Despite these difficulties, we have compiled an objective chart of consumption rates. Our information was provided by a variety of sources, ranging from manufacturers, fellow researchers, advocacy groups, and independent meter readings.



LED units generate heat, and cannot function well in heat which reduces the unit's life expectancy. As a result of the tremendous amount of heat generated in LEDs , and the additional impact of hot weather on the signs, an air conditioning unit is incorporated to cool the components. The energy drawn from the grid is highest during the summer months when the heat from the sun coupled with the heat generated by the higher brightness of the LED unit requires increased demand on the air conditioning system installed for cooling the LED unit. This energy use corresponds directly with maximum peak demands from businesses and residences. Utility companies now provide a discount for homeowners if they can disconnect their air conditioners from the grid during the peak load demands. There is no discussion or plan that we are aware of to disconnect LED air conditioners or darken signs during periods of high demand. If traditional billboards continue to be replaced by LED signs, the growing draw of energy during peak hours could negate the efforts of Utility companies to reduce demand during peak times.

Rates of Energy Consumption		
Product type	**Annual Usage, kWh***	**Annual cost****
Unillumintated Static Sign	0	$0
Noventri "green" player	35	$4.80
Noventri PC based player	1,752	$240
Corn Digital 42" LCD Display	2,103	$288
Hewlett-Packard 47" LCD Display	2,737	$375
Salescaster Corp. 76"x12" LED sign (8-color)	4,380	$600
Static Billboard (4) Halide Lamps - calculated	**7,008**	**$960**
LED Authority 36"x60" LED sign (full color)	8,760	$1,200
Average US home	**11,040**	**$1,512**
LED Billboard (L.A. Reading)	61,032	$8,361
Barco LED	73,584	$10,081
Lighthouse LVP2056	92,715	$12,792
AGX digital 14' x 48 ' billboard	117,866	$16,148
14' x 48' LED Billboard (Florida actual reading)	**162,902**	**$22,318**
EraLED Series P20 Billboard	249,690	$34,208
ThinkSign LED	248,993	$34,112
Optec Displays LED	323,773	$44,357
* Energy Usage (((24))((365))/1000		
** Average costs per kWh=$.137 (Metro Area)		

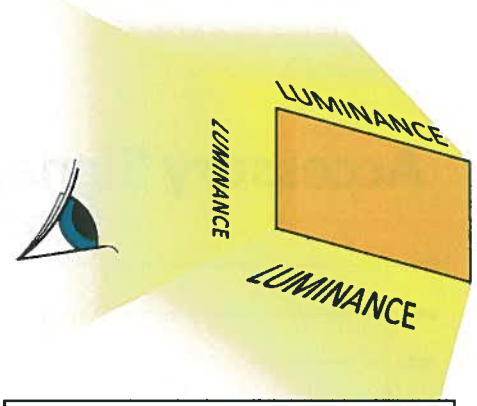
In many applications---such as television/computer display, general lighting, and small electronics---LCD, plasma screen, and LED technological advancements have proven more energy efficient than their predecessors, but research indicates that out-of-home advertising is simply not an appropriate or responsible application for digital technology.



Sign Brightness

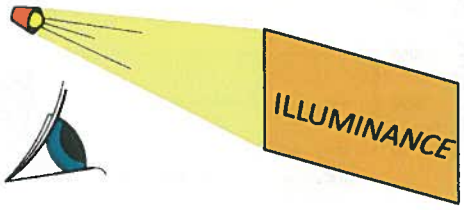
Measuring Sign Brightness

Apart from energy consumption, there are the important issues of light trespass and light pollution, which cause distraction, obscure stars in the night sky, and, like any other form of pollution, disrupt ecosystems and cause adverse health effects for humans and wildlife alike. Light trespass[5] is measured in two ways: luminance or illuminance. *Luminance* (measured in nits[6]) quantifies surface brightness, or the amount of light an object gives off. *Illuminance* (measured in footcandles[7]) quantifies that amount of light which falls onto an object.



This sign (above) gives off light.
Its **Luminance** is measured in **nits.**

By either measure, digital signage can create significant problems. "During daylight, an unlit static billboard will have a brightness which "fits in" with its surroundings; it will not cause excessive distraction because of excessive luminance" (Carhart, 2010, p.4). But, to capture drivers' attention, digital signs must be set to very high luminance levels, as they are essentially competing with the sun, which has a luminance level of 6,500 nits. If this extreme brightness is not modulated to fit nighttime conditions, we face issues including very high energy consumption during the day, light pollution in the evening, and potential driver distraction at all times. The OAAA (Outdoor Advertising Association of America) has guidelines to address brightness limits, but they are not mandated.



This sign (above) is being lit by a light source.
Its **Illuminance** is measured in **footcandles.**

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[5] **Light trespass** occurs when unwanted light enters one's property, for instance, by shining over a neighbor's fence. A common light trespass problem occurs when a strong light enters the window of one's home from the outside

[6] **Nit**—term used to describe a metric unit of luminance. It it is defined as candela per square meter (cd/m^2). The unit is based on the candela, the modern metric unit of luminous intensity; and the square meter.

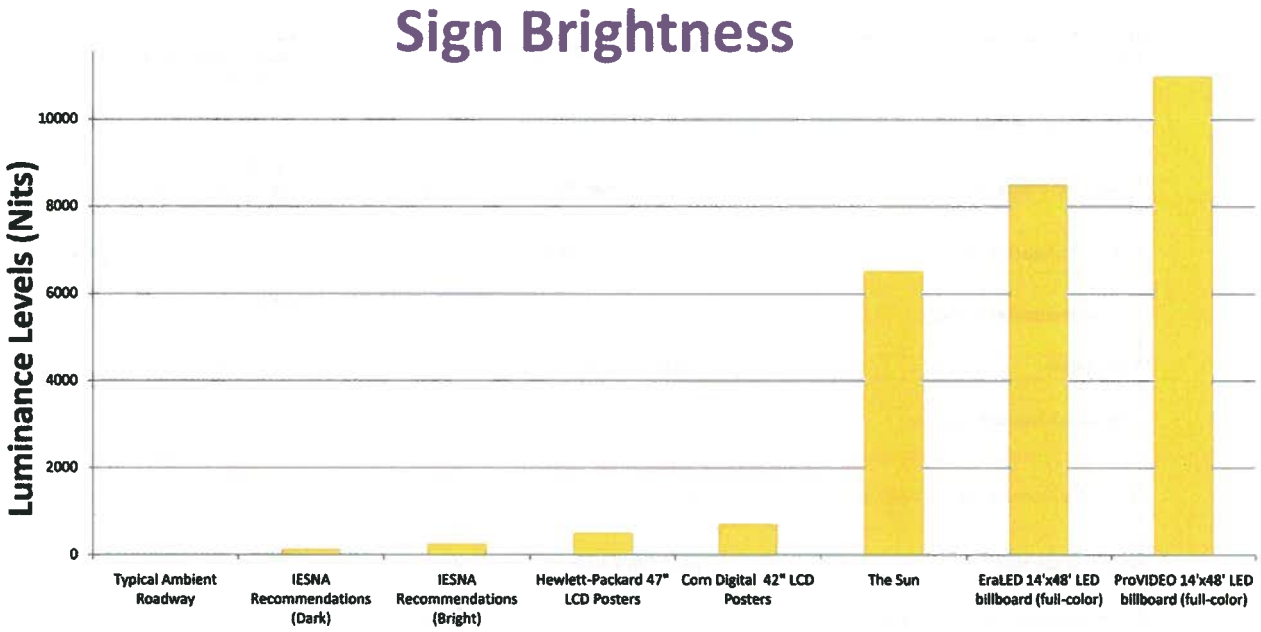
[7] **Footcandle** – Unit of light density incident on a plane (assumed to be horizontal unless otherwise specified), and measurable with an illuminance meter, a.k.a. light meter.

Observed and Recommended Levels of Brightness		
Information Source	**Product type**	**Luminance (surface brightness)**
(C.Luginbuhl study)	Typical Ambient Roadway Illumination	1 Nit
(C. Luginbuhl study)	Typical Floodlit Billboard	approximately 100 Nits
Digital Billboards: New Regulations for New Technology by Drew Carhart	Traditionally lit static billboards	98% were under 150 Nits, 83% were under 100 Nits (Arizona Study); 124 Nits average (New York Study)
IESNA recommendations	Recommendations for Digital Billboard Luminance	250 Nits (day), 125 Nits (night)
Outdoor Advertising Association of America (Ian Lewin Study)	Recommendations for Digital Billboard Luminance	300-350 Nits suggested (study based on light trespass readings)
Hewlett-Packard (Specifications)	47" LCD Digital Signage Display	500 Nits
Corn Digital (Specifications)	32" & 42" LCD Posters	500 Nits (32") 700 Nits (42")
Carhart study	Daytime sky (sunny)	5,000-7,000 Nits
Virginia Tech Transportation Inst.	The Sun	6,500 Nits
Senzen Top Technology Co., Ltd (specifications)	seires PH12 (14'x48' full-color LED billboard	8,000+ Nits
EraLED (Specifications)	Series P20 full-color LED billboard (assorted sizes)	8,500 Nits
ProVIDEO Billboard Panels (specifications)	Series 1515-4, 14'x48' full-color LED billboard	11,000+ Nits
Optec Displays (specifications)	model 1248, 14'x48' full-color LED billboard	11,000+ Nits
Optec Displays (specifications)	model 2040-5, 14'x48' full-color LED billboard	11,000+ Nits

Limiting Sign Brightness

Proposed limits on sign brightness have caused much debate. Research provided by the Illuminating Engineering Society of North America (IESNA) states that drivers should be subjected to points of brightness no greater than 40 times the average brightness level of their general surroundings; this proportion is known as the contrast ratio. "As roadway lighting and automobile headlights provide ambient nighttime lighting levels of about one nit, this implies signage should appear no brighter than about 40 nits" (Luginbuhl, 2010, p.1). Surprisingly, the IESNA's own recommendations for signage luminance suggest limits between 250-1400 nits---greatly exceeding their stated maximum contrast ratio of 40:1.

The OAAA, has deemed 300-350 nits an acceptable level of night brightness. However, their guidance is based on the use of the IEEE standard for light trespass (IESNA-TM-11-00), when, for reasons of traffic safety and glare in drivers' eyes, it should have been based on IEEE's standard for roadway sign lighting (IESNA RP-19-01).
Traditionally floodlit static billboards rarely exceed 100 nits; experts on both driver distraction and light pollution recommended that, as a means of compromise, the new technologies should not exceed this value. In many areas, including Philadelphia, brightness levels are currently unregulated, and many manufacturers publicize their signs' capabilities to reach up to 11,000 nits.



Digital signage advocates mention the horizontal louvers[8] included in many billboards as an effective measure to prevent light pollution. In reality, these louver systems were designed primarily to shade each diode from sunlight (thus increasing their prominence), not to limit nighttime glow.[9] As Luginbuhl states in "Lighting and Astronomy," horizontal light (that which is emitted between 0° and roughly ±20°, and not restricted by horizontal louvers) contributes even more to skyglow than light emitted at higher angles. The effects of lower-angle lighting----such as that used to captivate approaching drivers---- are visible over a much broader area (Carhart, 2010).

A better option is to simply operate signs at less than maximum brightness. Not surprisingly, sign brightness and energy usage are directly related; beyond reducing light pollution and distraction, lowering luminance reduces total power consumption. One manufacturer experimented with running their digital displays at half-brightness; they were able to reduce power usage by nearly 40%, while maintaining full sign readability (Noventri, see in chart). Another option for reducing unnecessary brightness (and thus power usage) is to equip signs with sensors which automatically lower light output in accordance with atmospheric conditions. For example, sign brightness would mechanically be dimmed during dusk, early morning hours, or during cloudy or overcast weather. Again, OAAA does have guidelines for dimming, but they are not mandatory.

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[8] A **louver** is a slat that is angled to keep out rain, direct sunshine, etc. The angle of the slats may be adjustable or fixed.

[9] Retrieved from http://www.optec.com

Materiality and Recyclability

Life Span

Light Emitting Diodes have a lifespan of 100,000 hours. According to Bryant, this equates to roughly eleven years for LED billboards, compared to the fifteen years for traditional static billboards. At that point, the diodes will be operating at 50% of their prime brightness. Of course, considering the return on investment that the sign owner has received by that time, he or she will likely not hesitate to replace the sign quickly (Bryant, 2008). As these large digital displays and their associated digital players increase in popularity, will we soon face an abundance of difficult to recycle, discarded technology?

Techno-Waste

Obsolete technology is a valuable source for secondary raw materials, if treated properly; if not treated properly, it can be a source of toxins and carcinogens. Rapid industrial advancement, decreasing initial cost, and even planned obsolescence could result in a fast-growing surplus of "techno-waste" (Morgan, 2006). LED's, plasma and LCD screens, and digital players and extenders *are* recyclable, but their de-manufacturing and reuse is not always mandated or monitored.

In the US, the main federal law governing solid waste is the Resource Conservation and Recovery Act of 1976; as far as electronics are concerned, it covers only cathode ray tubes (televisions and computer monitors popular before LCDs, plasma and LEDs), though state regulations may differ, according to the U.S. Environmental Protection Agency. Volumetrically, digital signage does generate more waste to be recycled than the paper, vinyl sheets, and plywood or canvas facing of static billboards, but lacks the potentially toxic adhesives.

Technological Graveyard: A massive collection of now-obsolete Cathode Ray Tube televisions. Could digital signage one day face a similar fate?

Future Technological Innovation

Digital display types have become increasingly energy efficient since their inception, a trend that will likely continue. While early generations of LED lamps could produce only 20 lumens per watt (compared to about 15 lumens/watt for incandescent), current models can achieve over 100 lumens/watt (Klipstein, 2009). More energy efficient players are also in development, including a model that uses only 4 watts of electricity, the equivalent of a single small light bulb. As technology continues to progress, there is hope that digital signage may one day be a truly green option, but we are not there today.

Solar Power

Solar power is one promising advancement recently used in the installation of a 6,000 sq. ft. digital billboard in Times Square which is fully powered by solar panels and photovoltaic solar modules, and illuminated by floodlights. It consumes no additional electricity. According to Cooley's Commercial Graphics, manufacturer of the solar sign, "These lightweight systems could be installed on some portion of the 450,000 billboards currently in the United States. Each of these billboards would generate clean renewable energy to either power the billboard lighting system or would be sold back to local utility companies through net metering or feed in tariffs programs" (Connor 2010).

A similar program has been implemented in San Francisco, and successfully generates up to 3.4 kilowatts of excess energy, distributed to local utility customers.[10] Some are skeptical, however; an industry insider states, "illuminating signage via solar power poses a significant hurdle, because harvesting and processing solar energy is relatively inefficient," and estimates that approximately only 20% of energy collected could be retransmitted as sign illumination (Aust, 2007). While these green advancements are laudable, they are climate-dependent, and their high initial costs make them unlikely for mainstream usage without government mandates or incentives.

Carbon Footprint						
	Average 2008 Air Travel (Total US Commercial air travel for 2008 / Census Estimate of total US population)	Average 2008 travel by passenger car: calculated for small car	Average 2008 travel by passenger car: calculated for SUV	Average Home	Digital Billboard (LA. Reading)	Optec Displays LED
Total annual emissions (tons)	0.93	2.48	6.59	8.28	45.77	242.82
No. of trees to offset per year	4.66	12.38	32.96	41.4	228.87	1,214.10

[10] (2007, December 3). Retrieved from http://www.environmentalleader.com/2007/12/03/pges-green-campaign-gets-solar-powered-billboard/

Economic Feasibility and Return on Investment

Off-Premise, Non-Accessory Billboards

In addition to their environmental impacts, we looked into the profitability of digital billboards, and received mixed results. Although LEDs are expensive, manufacturers frequently claim that cost is recouped over time and in reduced energy usage and maintenance costs. For off-premise advertising, the initial investment in a digital sign is large---$250,000-$500,000 (Goldstein, 2008)---but future overhead for the advertising company is low, as graphics can be remotely changed and replaced. Often, they are also able to rent out the advertising space for a higher premium than on static billboards.

Space on a digital billboard rents at the same rate, or higher, as a comparably sized static billboard, even though each ad will be featured only intermittently, sharing space with up to eight other advertisements in the rotating lineup. This means huge profit increases for the outdoor advertising companies, and a quick return on investment. Digital billboards provide operators with an average of $14,000 per month in rent (typically from multiple advertisers), compared with $1,000 to $2,000 per month for traditional billboards, which serve only one advertiser (Goldstein, 2008).[11] Total revenue from the outdoor digital signage equipment market in the United States, including hardware, software, installation, and maintenance, grew by about 33% in 2009, a trend that is expected to continue. The Federal Highway Administration estimates that in 1996 there were over 400,000 billboards on federally controlled roads, which generated revenues in excess of $1.96 billion (Schueller, n.d.).

On-Premise, Accessory Signs

On-premise advertising appears to be less cost-effective. The initial cost of installing a digital signage network has not been recouped by many of the operators interviewed, to say nothing of the dramatic increase in energy expenditures when compared to static signage (Noventri, 2010). Additionally, the burden of providing frequently-changing content falls on the operator; many small businesses simply do not have the creative staff or technical knowledge to create changeable graphic displays.

Despite uncertain profitability for on-premise signs, market statistics and lay observation point to the growing popularity of digital signage, both off-premise and on-premise. In the absence of guaranteed profits, their chief selling point is their uniqueness---the fact that they "stand out." However, as this type of advertising becomes more mainstream, and the market becomes saturated, how long can simple novelty justify its high financial and environmental costs?

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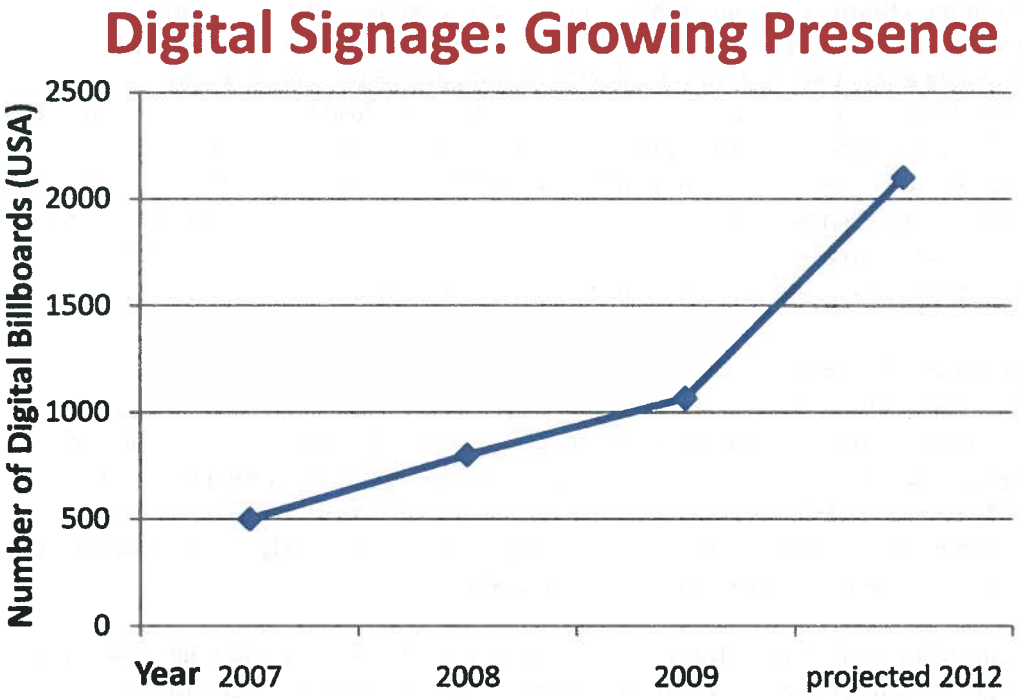
[11] Sales prices reflect market averages in Bangor, PA. Rates may vary with location.

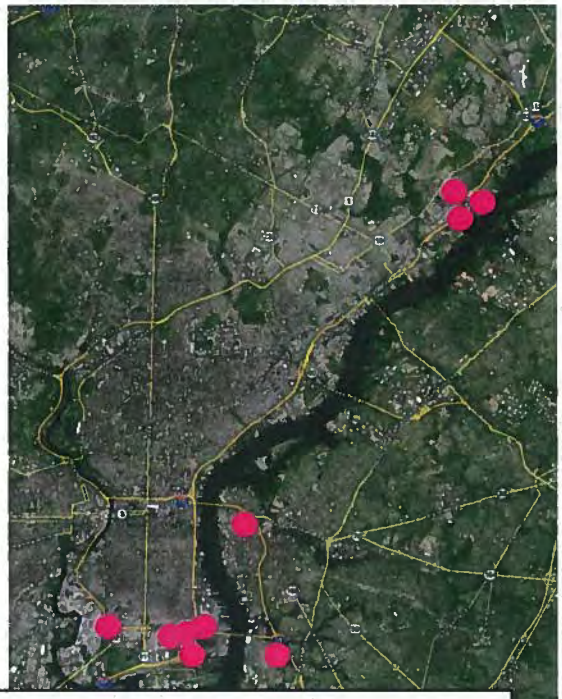
Current Trends

How big of a problem do unregulated energy consumption and luminance levels pose? Right now, only a small fraction of American outdoor advertising is digital. This number is growing, however, and the trend shows no sign of slowing. Rapidly-dropping prices for large LED screens have led to a growing increase in the number of digital signage installations. Today, there are nearly 800 of these digital billboards in the U.S. It's a small number compared with 450,000 traditional billboards across the country, but it's growing fast. The Outdoor Advertising Association of America, an industry trade group, projects that the number of digital billboards in the U.S. will expand at a rate of several hundred per year (Goldstein, 2008). Clear Channel Outdoor Holdings, an industry powerhouse, says it is expanding its digital billboard business in markets such as Los Angeles, Chicago and Philadelphia (Hau, 2007). Philadelphia is home to an estimated 1,800 billboards, including a handful of digital signs---the effects of widespread conversion from static to digital would raise significant safety and environmental issues.



Rapid Growth: The number of digital billboards is increasing at an increasing rate in the US, as evidenced by the above graph. On-premise digital signage has shown an even more dramatic increase in popularity (Urazbaev, 2009).

How Does Philadelphia's Current Zoning Code Regulate Electronic Signage?



Pink dots denote Philadelphia's current inventory of digital billboards (10 total), concentrated along I-95 and the Schuykill Expressway

Simply put, it doesn't address the technology. Signage regulation within the Philadelphia zoning code (Section 14-1604) was passed in the early 1990s and does not specifically address electronic outdoor advertising. The code for on-premise signage (storefront signage) is equally devoid of controls on electronic signage, opening an opportunity for these kinds of signs in all commercial districts.

A leader in the outdoor advertising industry, Clear Channel, has embraced the digital trend. The company has revamped several of its existing static billboards to LED format along the I-95 corridor in Philadelphia. In order to proceed with the conversions, Clear Channel sought the approval of Philadelphia's Department of Licenses and Inspections (L&I), which granted permission for the conversions to take place with few requirements. This interpretation was made in spite of clear language in the code prohibiting an outdoor advertising sign from carrying more than two messages at one location. Under L&I's current interpretation of the code, any billboard that is 500 feet or more away from residentially zoned property may be converted to electronic as of right. If this interpretation remains in place, this could translate to hundreds of converted electronic billboards – the only factor moderating conversions right now is the (continually decreasing) expense involved.

Examples from Other Cities

To date, no known city has passed limits on sign energy usage, but about one quarter of states in the U.S. prohibits moving or animated signs, and roughly one third have specifications for dwell time ranging from four seconds to several minutes. Most states prohibit flashing red lights and anything that causes a glare or vision impairment.

Pittsburgh, Pennsylvania

A proposed amendment to Pittsburgh's zoning code states that no electronic sign may exceed .3 foot candles illumination above ambient light level to prevent distraction and interference with traffic signals. As discussed earlier in this paper, OAAA recommends foot candles in its guidelines but the usefulness of this measurement has been questioned and nits is the preferred measurement for detecting brightness and glare emitted from digital signs). Additionally, Pittsburgh's amendment sets a dwell time of at least ten seconds, and prohibits animation of any kind.[12]

Concord, New Hampshire

Some cities and states have banned electronic message boards outright, including Concord, New Hampshire. There, the ban on electronic message centers was upheld on appeal to the First Circuit Court, on grounds that the ban promoted both traffic safety and community aesthetics (Carpentier, 2009). [13]

Panama City Beach, Florida

In the absence of a cohesive state or federal policy, residents and policy makers in Panama City Beach, Florida decided they could not allow digital signage to continue to proliferate unfettered. They drafted a set of restrictions on sign size, placement and brightness which have been incorporated into the City Code. "The specifications make regulation seem like an exact science, when it's really just public and private actors negotiating acceptable limits," voices one critic. While imperfect, it sets a valuable precedent for regulation because the proposed ordinance limits the amount of light digital signs can emit, their illumination must be measured and monitored by an instrument widely available and specially designed for this purpose.

Tulsa, Oklahoma

The study "Digital Billboard Recommendations and Comparisons to Conventional Billboards" recommends billboard brightness of 342 nits for an average sized (10'6" x 36') billboard under average ambient lighting conditions (Lewin, 2008).[14] In response to these recommendations, the Planning Commission of Tulsa, Oklahoma recommended a limit of 300 nits for all signage, but this was raised to 500 nits before becoming law, due to pressure from the outdoor advertising industry.

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[12] The Pittsburgh Code, Title Nine, Zoning Code, Article VI, Chapter 919, Signs.

[13] Naser Jewelers, Inc. v. City of Concord, 2008. WL 162521 (C.A. 1 N.H. 1/18/2008)

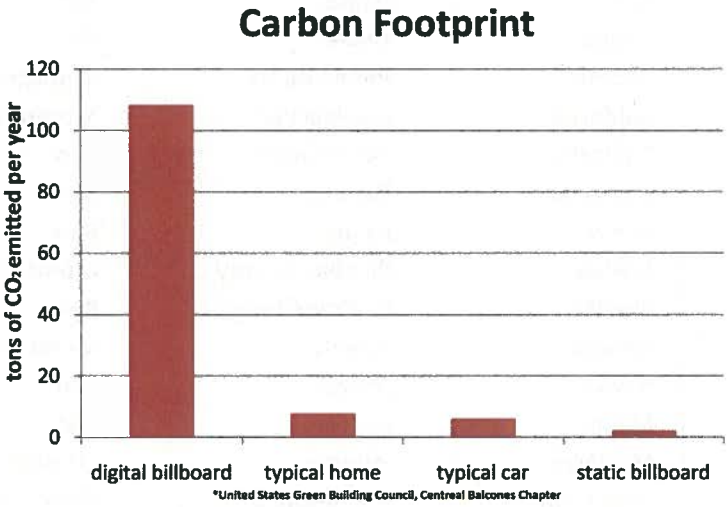
[14] n.b. This study was funded by the Outdoor Advertising Association of America.

Municipalities that ban or limit digital billboards

STATE	CITY/COUNTY	ACTION TAKEN
Alaska	(state)	Ban
Arizona	Gilbert	Ban
Arizona	Pima County	Moratorium
California	Los Angeles	Moratorium
California	San Francisco	Ban
Colorado	Denver	Ban
Florida	Largo	Ban
Florida	Pinellas County	Moratorium
Florida	St. Petersburg	Ban
Georgia	Atlanta	Moratorium
Hawaii	(state)	Ban
Maine	(state)	Ban
Michigan	(state)	Considering Moratorium
Minnesota	Minnetonka	Moratorium
Minnesota	Oakdale	Moratorium
Minnesota	(state)	Considering Moratorium
Missouri	Lake St. Louis	Ban
Missouri	St. Louis	Moratorium
Montana	(state)	Ban
North Carolina	Durham	Ban
Rhode Island	(state)	Moratorium
Tennessee	Knoxville	Ban
Texas	Amarillo	Ban
Texas	Austin	Ban
Texas	Dallas	Ban
Texas	El Paso	Moratorium
Texas	Ft. Worth	Ban
Texas	Galveston	Ban
Texas	Houston	Ban
Texas	San Antonio	Moratorium
Vermont	(state)	Ban

Policy Recommendations: Electronic Signage and Philadelphia's Future

Philadelphia is currently in the process of a complete overhaul of its zoning code and comprehensive plan, bringing the city into the present and preparing for its future. A recently released draft of the updated code does aim to control digital advertising, but more (and better) regulation is needed; the draft focuses on off-premise advertising, and is particularly relaxed regarding on-premise electronic message boards.



For the purposes of controlling light pollution and energy consumption, the distinction between on-premise and off-premise signage is of little relevance; as such, we offer similarly cautionary restrictions for both sign types, from a traffic safety perspective, on–premise signs may be worse. They can be bigger, closer to the roadway, have motion and animation (Wachtel, 2009).

Our first issue with the draft is one of semantics: currently, the draft specifically regulates any sign with action or motion, animation, rotation, scrolling, flashing or color changes, or upon which illumination is not maintained at a constant stationary intensity and/or color, as a means (we assume) of regulating digital signage in general. We anticipate that this language could create the opportunity for misinterpretation; electronic and digital message boards are not necessarily flashing/animated/intermittent, as they are capable of the display of static, yet still excessively bright, imagery. Advertising companies often specifically describe their digital signage as "static," as a way to circumvent inexplicit regulation such as this.

We suggest revising the zoning language to include any and all digital signage, defined as any sign capable of displaying words, symbols, figures or images that can be electronically or mechanically changed by remote or automatic means,[15] ***not*** just those that are animated, flashing, or intermittent, which can be subjective descriptions.

[15] From Oklahoma City Municipal Code, 2007, Chapter 3, Article V, Section 3-82.

The current draft states that off-premise digital billboards are not to be located within 500 feet of an entrance or exit ramp to any major highway, or within 200 feet of any intersection of the street or highway on which it is intended to advertise to. For off-premise signage, the proposed code prohibits flashing signs, signs with intermittent illumination, or signs with mechanically or electronically changing messages within 500 ft. of any residential district. It also prohibits them from facing any residential district within 1,000 ft. For on-premise digital signage, these distances are lowered to 150 ft. and 300 ft., respectively.

16th & Washington, Philadelphia
On-premise LED sign

We recommend that this regulation be expanded and increased; best practices from the Australian states of Queensland, Victoria and New South Wales, South Africa and The Netherlands illustrate the rigor with which the situation of electronic advertising must be assessed before it can be deemed safe for motorists and other road users. Among the considerations these governments require in assessment of the placement of outdoor advertising are: traffic speed on the adjacent roadway, sign content, legend height, vicinity of official traffic control devices, type of street or interchange, sign brightness, hold time, sign content, the potential that an advertisement will be mistaken for a traffic control device, the amount of information communicated, the concision and legibility of the advertising message, and an advertising structure's obstruction of key sightlines. These best practices are detailed in the attached Appendix D, Excerpt from *2009 AASHTO Report*. (Wachtel)

According to the present draft, signs may be illuminated, but the illumination shall be focused upon the sign itself, so as to prevent glare upon the surrounding areas, and digital billboards must have a luminance level appropriate to the ambient environment in keeping with the standards set forth by the Illuminating Engineering Society of North America (IESNA). These regulations are too vague; we propose specific limits to prevent light trespass and light pollution. As such, the illumination projected from any use shall at no time exceed 0.1 footcandle onto a residential use, and 1.0 footcandle onto a non-residential use. This should apply to light emitted from any form of signage, on-premise or off-premise. We also propose specific luminance limits of 100 nits for nighttime conditions, applicable to all digital signage. (Lebenbuhl)

Additionally, there must be prescribed methods for determining compliance with the aforementioned illuminance and luminance limits. Again, ***illuminance*** measures the amount of light which falls onto an object; ***luminance*** measures the amount of light an object gives off. To gauge light trespass on neighboring properties, illumination shall be measured (in footcandles) at any time and from any point on the receiving property line using an illuminance light meter. While an illuminance meter is a practical device with which to measure light trespass, inherent sign brightness is best measured using a luminance meter, which is capable of directly measuring the surface brightness of signs. Luminance meters are quite costly; sign owners should be financially responsible, by means of permit fees, for any and all equipment/operational costs needed to ensure that their luminance levels remain in compliance with aforementioned limits.

Luminance limits between the full sunlight limit and the nighttime limit may also be specified for overcast or foggy days. Regulations should require an automated control of sign luminance based on current ambient lighting conditions. To further control light pollution, off-premises digital signs shall be extinguished automatically no later than 11:00pm each evening until dawn. Signs for establishments that operate or remain open past 11:00 p.m. may remain on no later than one half hour past the close of the establishment.

Where new digital signage construction or digital conversions *are* permitted, there should be a "trade-off" policy, based on power consumption. For every square footage of digital signage an outdoor advertising company installs, via new construction or conversion, they must remove a specified amount of square footage of their existing static signage, in order to maintain or reduce their carbon footprint. Such a policy has been implemented in many cities and states. Finally, obsolete or otherwise discarded digital signage, and all accessory components, must be fully recycled at the expense of the manufacturer.

Conclusion

Our research and the resultant policy recommendations could not come at a better time, as digital signage figures prominently on several hot-button issues regarding Philadelphia urban development. For example, the Market East corridor of Philadelphia is in great need of renewal and rethinking; the look and feel of the "new" Market East is a very controversial topic. Councilman Frank DiCicco's Outdoor Advertising Bill 100013 takes away the city's ability to regulate signage and will allow massive outdoor advertising signs including LED digitals and rooftop billboards along Market Street between 7th and 13th Streets, transforming Market East into a garish thoroughfare reminiscent of the Las Vegas Strip.

Paul Levy, president and CEO of the Center City District and a key player in the revitalization of Market East, is amenable to the sorts of eye-catching wraps, digital and LED signs, though he says the city must make sure they stimulate development.

"Building owners shouldn't get to throw up a giant ad on a tiny decrepit storefront. They should only be able to profit from these signs --- and thus generate tax revenue for the city --- if they renovate their properties in line with city standards and fill them with people" (Rubin 2010).

Over the past ten years, many studies of digital signage have focused on the issue of driver distraction and road safety. These studies have been conducted in many countries (e.g. U.S., U.K., Australia, South Africa, The Netherlands, Norway, and others) and they have used a variety of research methods, including simulator and laboratory investigations, opinion surveys and focus groups, on-road studies in instrumented vehicles, and longitudinal analysis of summaries of traffic collision reports. With only two exceptions, those recent studies performed by government agencies, universities, and non-profit traffic safety organizations, have found a detrimental effect on driver distraction (or other measures of traffic safety) in the presence of billboards. The only studies that have reported no adverse safety impact of digital billboards have been those sponsored by the outdoor advertising industry.

And we use the word "reported" advisedly. That is because, in one case, despite the study authors reporting no distraction from digital billboards, the actual data collected clearly showed such an adverse impact. And, in the other case, despite the study authors reporting that the presence of digital billboards had no effect on traffic crashes, the authors have been challenged by experts, both in peer review and in public forums, for using improper statistical methods - with the results that their reported conclusions are unjustified and should be retracted.

The Federal Highway Administration is nearing completion of its own on-road research study looking at levels of driver distraction as measured by eye movements in the presence and absence of digital billboards. This report is expected to be available in the first quarter of 2011.

Higher electricity consumption, increased light pollution, and recyclability issues should make us pause and question the growing popularity of digital signage. As America at last embraces sustainability and Philadelphia strives to become the "greenest city in America," is a proliferation of digital signs along our highways and storefronts sending the right message?

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Visit http://www.publicvoiceforpublicspace.org/ for more information.

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