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Reducing the carbon footprint of spectator and team travel at the University of British Columbia's varsity sports events

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ABSTRACT

The carbon footprint of spectator and team travel was analyzed at small-scale varsity sports events held at the University of British Columbia. Sport management literature suggests a need for quantitative environmental impact studies of events, in particular to seek out transport footprint reduction opportunities. This study applies a Life Cycle Assessment (LCA)-based approach to increase methodological rigour and transparency. We analyze travel patterns of spectators and teams and put forward several scenarios for impact reduction. Results show that UBC spectators had a smaller footprint than teams on a per person basis but a larger overall carbon footprint. Although only 4% of the spectators travelled by air, this constituted 52% of total spectator impact. We find the biggest opportunities for footprint reductions by spectators and teams alike are strategies that (a) reduce long-distance air travel, (b) increase vehicle occupancy rates, and (c) encourage low-emission travel mode choices.

1. Introduction

Climate change due to human activities is a pressing concern that could lead to extreme levels of social, ecological and economic disruption over the next century. The United Nations Intergovernmental Panel on Climate Change (IPCC) said in its most recent Climate Change Assessment Report Summary for Policy Makers:

> Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased (2013, p. 3).

The report further cautions: "Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions" (2013, p. 14).

Along with other sectors of society, sport organizations need to address existing environmental issues and mitigate environmental harm. Sport can be both a contributor to environmental degradation and be directly impacted by its effects. Winter sports are a good example, where resorts suffer from shorted snow seasons due to climate change and yet contribute to the problem by using energy to make artificial snow (Scott, McBoyle, & Mills, 2003). Air pollution levels are another

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oft-cited problem as evidenced by the concerns for athlete health surrounding the Beijing 2008 Olympic Games due to the high levels of particulate matter (Streets et al., 2007). A side effect of the globalisation of sport has been a growing contribution to environmental impacts, due in large part to the resulting increase in participant travel to events (Thibault, 2009).

Beyond addressing the environmental impacts caused by events themselves, a number of researchers have suggested that events are also worth investigating as an opportunity to leverage wider change because they are highly visible platforms that have the ability to galvanize action (Death, 2011; Getz, 2009). Sport managers and university athletics' departments are taking a growing responsibility for climate change issues as they aim to improve the environmental sustainability of events and incorporate this messaging into stakeholder outreach (Mallen, Stevens, Adams, & McRoberts, 2010). Prominent recent examples include the low-carbon commitments of the London 2012 Olympic and Paralympic Summer Games (Hayes & Horne, 2011), the emergence of organizations such as the Green Sports Alliance for professional sports teams and college athletics departments, and the development and adoption of event sustainability management and reporting guidelines such as the International Standards Organization's document, *ISO 20121:2012 Event Sustainability Management Systems – Requirements with Guidance for Use* (2012) and the Global Reporting Initiative's *Sustainability Reporting Guidelines & Event Organizers Sector Supplement* (2012).

These guidelines refer to the broader concept of sustainability – most commonly understood as including three distinct but related spheres: society, economy, and environment. There exist many approaches to measuring sustainability, with most models designed to assess subsets rather than sustainability as a whole. A carbon footprint is typically understood as an approach to measure one type environmental impact: climate change, caused by the effect of greenhouse gas (GHG) emissions. Since climate change is one of our most pressing societal issues, carbon footprinting is an important arrow in the sport manager's quiver and should be considered alongside other important sustainability issues such as equity, water scarcity, affordability, or biodiversity.

The University of British Columbia sits in a regulatory context conducive to environmental sustainability and, in particular, to reducing greenhouse gas emissions. The Province of British Columbia has taken a strong leadership position in North America with respect to climate change policy. In 2007 it passed a binding legal commitment to reduce Greenhouse Gases to 33% below 2007 levels by 2020 as well as a mandate for its public institutions – including provincial ministries and agencies, schools, colleges, universities, health authorities and crown corporations – to become carbon neutral and report emissions. A 2008 bill added a revenue-neutral tax on GHG emissions from fuels burned in the Province.

UBC has embedded sustainability as one of its nine strategic commitments and signed a number of environmental sustainability commitments for higher education institutions including the Talloires declaration in 1990, the Halifax Declaration in 1991, and the 1998 Climate Change Statement of Action for Canada. In 2010 it set some of the most aggressive climate change targets among top 40 ranked universities in the world, aiming to reduce greenhouse gas (GHG) emissions 33% below the 2007 benchmark level by 2015, 67% by 2020 and 100% by 2050 (UBC Sustainability Initiative, 2012).

One of the most direct implications for the UBC Athletics Department is the fact that direct fuel consumption from building operations falls within the provincial and public institution requirements to pay tax and offset fees on carbon emissions. Additional activities within Athletics operations such as travel do not fall under this scope since the department is managed ancillary to the University. Further impacts such as those arising from out-of-province air travel, agricultural production of food, or material and equipment production, for example, also do not fall under current Provincial mandates and go unmeasured. UBC Athletics does not currently conduct in-house carbon footprinting on their activities.

At UBC – as with most North American universities – athletics form a major part of campus activities and operations, with over 20 sport venues including fields, stadiums, an aquatic centre, a tennis centre, indoor gymnasiums, fitness facilities, and ice hockey arenas. The UBC Athletics and Recreation department (hereafter UBC Athletics) manages 23 varsity "Thunderbird" teams that travel across North America to participate in the Canadian Interuniversity Sport (CIS) league and the National Association of Intercollegiate Athletics (NAIA). The Thunderbirds teams compete in approximately 500 events per year, with one third typically hosted at UBC. Total annual attendance at all UBC home events in 2011–2012 season was approximately 40,000 spectators (Dolf, 2012). However, despite the campus-wide emissions reduction mandate, Athletics' events have not yet been considered as a major source of emissions-reduction opportunities.

We focus on the methodology and implications of the carbon footprint of participant travel at small-scale varsity events held at UBC, where typical events have 50–1000 spectators. Few peer-reviewed studies have conducted in-depth quantitative analysis of the environmental impacts of event travel, particularly on small to medium sized events. The events that do report their carbon footprints typically show significant GHG emissions associated with travel but more rigour is needed to examine the underlying travel patterns and opportunities for impact reduction. Investigating the travel impacts of different types of events is of practical importance, particularly since sport events vary widely in terms of characteristics such as size, importance, geographic location, or participant demographics. Understanding the travel patterns and the opportunities for maximum influence would support sustainability programme decisions at UBC and provide a template for analysis for other university athletics departments.

We examine the following research questions: (1) How can carbon footprint methodology be adapted for event managers to estimate the climate change impact of travel in a rigorous yet rapid manner? (2) What are the spectator and team travel mode choices and travel distances for UC varsity events and which of these have the largest environmental impact? (3) What opportunities exist for travel footprint reduction of UBC events and how might they be generalizable to other small-medium sized events?