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"Where to draw the line?" That is a land use planning question for the land surveyor and the town planner

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ABSTRACT

Inspired by the pioneering work of Bleakley and Ferrie (2014) informed by Libecap and Lueck (2011), this paper develops the thesis of Lai (1996, 1997) that spatial partition of land is a basic land use planning activity, whether by governments or private bodies, which involve decisions on boundary delineation. The primaeval foundation of this activity is laying out private property boundaries, which is a metonymic *land unitisation* exercise that defines "clearly defined property rights" in the Coase Theorem and has often been forgotten as a *bona fide* planning one. All major constitutional changes in nations commence with such a layout exercise, in which the land surveyor plays a principal role; and all land use planning innovations build upon and property development are constrained by this primaeval foundation, which has huge transaction cost implications. A Colonial Hong Kong example, the Kowloon Walled City, is used to demonstrate the importance of the proper state ordering of property boundaries. The actual postwar-boundary of this City has hitherto been ignored by all commentators. The emergence of modern "cross-boundary" issues resulting formally from overlapping formal land boundaries and created by industrialisation and information technology does not alter this characteristic of planning generically as drawing and redrawing of boundary lines. Some land use policy issues related to cross-boundary environmental problems and land registration are discussed.

Preamble

> We are face to face with the gravest economic problems arising out of landed property; and when we turn to economic treatises we find little to help us in their solution (Ely, 1917: p. 18).
>
> One of the most striking features of the Scottish countryside is its geometric appearance. . .The origin of this field pattern can be found in the spread of ideas current in England and the Continent. . .The *land surveyor* played an important role in the making the new landscape. . .for the land surveyor not only made cartographic plans but also practised *planning* in the modern sense of the word (Adams, 1968: pp. 248–249, italics author's).

For those economists with a sustained interest in it,[1] the hint on how to solve the great mystery of land property by Ely (1917) almost a century ago, as quoted above, may be the passages of Adams (1968), which were also quoted above. Private property rights on land, being *in rems* rights (Arruñada, 2012), have a spatial dimension because they involve boundary delineation, which is *bona fide* land use planning. The story of Scotland, predated by what happened to Roman cities and the capital cities of Imperial China and Japan, was repeated in Canada and the United States of America's homesteading practices (Allen, 1991). However, no one seems to have realised that the laying out of private property boundaries is an act of land use planning that continues to affect the effectiveness of government planning intervention.

Introduction

Land use planning is definitely not simply a matter of drawing lines on a piece of paper. However, it always involves drawing lines to produce, in mathematical terms, a loop (or loops) which encloses (enclose) an area (areas) on a map intended as a plan to govern land use and/or building etc. in specific locations. As cadastral boundaries of private property, which are a form of "*fiat boundaries*" (Smith, 1995; Smith and Varzi, 2000), these lines are all at once means to assign rights and obligations that run with the land and constraints on development and redevelopment. As a primaeval

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[1] Economists' "production functions," which stand for the relationship between inputs and outputs, have never been able to capture land as an input or output. To treat land as depreciable capital input, "K," is problematic insofar as land means three-dimensional space.

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form of zoning, the lines delineated on maps and their identification on sites are the work of land surveyors. Furthermore, there is a *metonymic* relationship[2] between the planned loops (or "zones") and the states. While these zones "contain" land for various uses, they are contained within the boundaries of the state.

Such primaeval state planning boundaries, often in existence well before the rise of the modern planning professions, can be adopted or disregarded by modern town planners, except during discussions of "land adjustment" in "other countries" for the purpose of government planning by edict.

This is not a new idea as Lai pointed out 20 years ago (Lai, 1994: p. 90; Lai, 1997: p. 234) that boundary delineation is a neglected *ontological* attribute of land, "extension", and boundary delineation is zoning broadly defined. This concept was used in the empirical development inquiry of zone separation by Lai and Ho (2001). Lai and Zoppi (2011), following in the footsteps of Hillier (2010), applied the term to communicative planning articulation, which is, however, not spatial, but relational.

In this light, it is surprising that the connection between land surveying and town planning in terms of property rights has been underdeveloped. This is due probably to division of labour between the two professions and separation of academic endeavour. The neglect of such a fundamental dimension of property rights delineation and planning is gradual and this is an area worthy of in-depth inquiry. As far as planning is concerned, the opinion of this author is that it was due to the rise of a-spatial social science in planning theory, a point mooted by Lai (2014).

This paper re-connects them in terms of their focus on property boundaries, which are the foundations for land use planning and development, both predicated on land surveying, in a market economy. The very important practical and theoretical considerations for this connection are twofold.

First, the spatial "partition" of land (i.e. *zoning*) is a basic feature of private property rights over land (Buchanan, 1993) and use planning activity (Webster and Lai, 2003), whether by government or private bodies, which involves practical decisions made on boundary delineation by land surveyors and town planners. Note that the distinction between surveying and planning as distinct professional realms has a British origin and is standard in most English-speaking jurisdictions. Surveying is further divided into marine surveying, land surveying, estate management and quantity surveying. In non-English-speaking countries, as in the case of China, these two activities are often subsumed under the engineering profession. The need or significance of land surveying for development has been mainly articulated in terms of land reforms in developing nations, as epitomised in such informative works as Takigawa (1972), Feder and Feeny (1991), Shlezfer (1994), Hendrix and Rockcliffe (1998), Bogaerts et al. (2002), Barnes (2003), Cashin and McGrath (2006), Lusugga Kironde (2006), Maandi (2010), Parsa et al. (2011), Van Westen (2011), Wang et al. (2012), Colin (2013), McCluskey and Trinh (2013), and Simbizi et al. (2014). The economic analysis of Bleakley and Ferrie (2014) is an interesting exception, as land surveying is related to land use outcomes, though not specifically land use planning, and their theorisation is conducted under the Coase Theorem. The research design of Bleakley and Ferrie (2014) was influenced by Libecap and Lueck (2011) and Libecap et al. (2011), who considered that a rectilinear way of laying out property boundaries (the so-called "Rectangular Survey" system) saves more on transaction costs than the old "Metes and Bounds" method. The same was observed by Lai (1996) for Hong Kong, where the "metes and bounds" (basically earth bunds that were used as access and, at the same time, dividers of paddy fields) were characterised as "Demarcation District Lots" inherited from imperial China, as surveyed and recorded after an 1899 survey by staff seconded from the British Indian administration. Lai did not go far enough.

Second, this primaeval foundation of spatial partition by laying out private property boundaries that are within, if not exhausting the meaning of the assumption "clearly defined property rights" for the Coase Theorem, is itself a land surveying and unitisation exercise and has often been forgotten as a *bona fide* planning activity. This assumption is often taken literally by theorists as referring to detailed manifestations of different modes of property rights such as law or governance. This is sound in a general theoretical sense, but the strict original meaning of "clearly defined property rights" that corresponds to the facts of Coase's story is also important for appreciating the contribution of the Coase Theorem to land use planning because it actually refers to "clearly delineated property boundaries"(Lai, 2007: p. 357). This is elaborated in the following section.

Theoretical context: the Coase Theorem and land unitisation

The Coase Theorem has been applied by a few trained economists to address such spatial matters as town planning and real estate. But their writings seldom appear in "mainstream" economic journals, which concentrate on a-spatial applications. This is interesting, as the Theorem was born out of a spatial and, indeed, land use planning story told by Coase in the first part of "The Problem of Social Cost" (Coase, 1960).

The story is about a hypothetical conflict of interest between a cattle rancher and wheat farmer whose properties adjoin. The analysis was on how the effect of cattle intruding onto the wheat farm and eating the crops could be handled under alternative legal regimes that assign liability against either party. While economists recognise that Coase's analysis qualifies Pigou's solution to *ex ante* externalities, which are *cross-boundary* and represented by the straying cattle in the story, their interest lies more in the a-spatial dimension of the Theorem, namely a contractual solution that does not depend on who owns the rights against trespassing.

Once economists realise that the story is about land use planning, they focus on the contractual solution rather than the starting point for the pre-contractual negotiation, which is the very existence of a property boundary that demarcates or "zones" two different plots of land. It is true that this boundary is subject to negotiation and can be imagined as movable to internalise any external effect, upon mutual agreement, in such a direction so as to maximise the joint value of both types of activity. It has been well-argued that this private or market solution is as good as state planning intervention by zoning under zero transaction costs. Yet, an initial property boundary must be identifiable and agreed on by both parties in the first instance. Lai's (2007) interpretation of the Theorem identified its assumption of "clearly defined property rights" so as to not double-count the other assumption of "zero transaction costs" as "clearly delineated property boundaries" (Lai, 2007: p. 357). Lai's (2007) graphical illustration of the two pieces of private land in Coase's story by way of two loops with a common border as a line of partition can be further improved by placing these loops within a larger loop that stands for the spatial boundaries of the polity, which draws the loops and adjudicates and enforces private property rights.

In other words, any contractual solution reached under the Coase Theorem must refer to an original property boundary in such private planning settlements on land use compatibility. This explains the significance of property boundaries in land use planning. The drawing or laying out on a map of such boundary lines, in which the land surveyor plays a principal role, is itself a major

[2] The author was informed by the work of Davies (2006: p. 189), who used the term to compare the ocean to a container that is itself contained.