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Martin Young  
*Charles Darwin University*

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# Re-placing geographic accessibility: A response to the Productivity Commission

**MARTIN YOUNG**

School for Social and Policy Research, Charles Darwin University, Casuarina, Northern Territory, Australia 0909. Email: martin.young@cdu.edu.au

## **Abstract**

Australia has widespread availability of EGMs in pubs and clubs in every jurisdiction bar Western Australia – a type of ‘venue-based convenience gambling’ that is unparalleled in the western world. In this context, the question faced by the Productivity Commission is what value, if any, supply-side approaches to regulation may offer in a spatially-saturated market. I argue in this short review that the control of geographic accessibility has the potential to be extremely useful in minimising gambling-related harm - far more so than credited by the Productivity Commission report. To develop this argument, I first briefly describe the Commission’s approach to gambling management, which is one focused on management of consumer behaviour within venues (i.e. demand) rather than managing the number and distribution of EGMs (i.e. supply). I then unpack the reasons for the Commission’s approach in downplaying the role of accessibility in regulation. I respond to those limitations through a discussion of recent research in local-area accessibility studies not specifically considered by the Productivity Commission (2010) report. I argue that recent advances in Geographic Information Systems (GIS) may offer fruitful directions in making accessibility studies both more applied and locally-relevant. I conclude by presenting a future for gambling management that incorporates local-area accessibility studies that are predictive, locally-based, integrative, and applicable at a range of scales.

**Keywords:** Geographic accessibility, EGM venues, GIS, regulation.

## **Introduction**

Supply-side efforts at gambling regulation, particularly those concerned with managing the accessibility of specific groups of consumers (usually defined in some way as vulnerable) to certain forms of gambling (usually electronic gaming machines (EGMs)), hold an intuitive appeal. After all, in Australia it is governments, through their licensing decisions, that have the final word in determining patterns of accessibility at both jurisdictional and local scales. In the words of the recent Productivity Commission (2010, p.14.2) ... “governments have the capacity to define the terms of access”. One of the key issues the current Productivity Commission Report grapples with, at least in the context of accessibility, is the role that such supply-side strategies may be able to play in a context where EGMs have already been highly spatially dispersed via the network of pubs and clubs. Indeed, the Commission points out at length in its chapter on the accessibility of gaming machines (Chapter 14) that, had more information been available during the 1990s about

the harmful effects of poker machines, then a model of liberalisation based on destination-based gambling rather than community-wide gambling may have been more appropriate. That said, the genie is effectively out of the bottle. Australia has widespread availability of EGMs in pubs and clubs in every jurisdiction bar Western Australia – a type of ‘venue-based convenience gambling’ that is unparalleled in the western world (Young & Tyler, 2008).

Given this situation, the question faced by the Commission is what value, if any, supply-side approaches to regulation may offer in a spatially-saturated market. I argue in this short review that the control of geographic accessibility has the potential to be extremely useful in minimising gambling-related harm – far more so than credited by the Productivity Commission report. To develop this argument, I first briefly describe the Commission’s approach to gambling management, which is one focussed on management of consumer behaviour within venues (i.e. demand) rather than managing the number and distribution of EGMs (i.e. supply). I then unpack the reasons for the Commission’s approach in downplaying the role of accessibility in management and specifically examine the political and evidence-base hurdles faced by supply-side regulatory models. I then respond to those limitations through a discussion of recent research in local-area accessibility studies not specifically considered by the Productivity Commission (2010) report. I argue that recent advances in Geographic Information Systems (GIS) may offer fruitful directions in making accessibility studies both more applied and locally-relevant. I conclude by presenting a future for gambling management that incorporates local-area accessibility studies that are predictive, locally-based, integrative, and applicable at a range of scales.

### **The Commission’s approach to gambling management**

It is clear from the recommendations and findings of the Productivity Commission’s 2010 report that its emphasis is on managing the behaviour of individual consumers, particularly those that are heavy gamblers. At the heart of this approach lie two recommendations that have received much media and political attention, namely Recommendation 11.1 - that all EGMs should be limited to a \$1 bet by 2016; and Recommendation 10.4 – that all jurisdictions should implement a pre-commitment system for EGMs by 2016. These recommendations are part of a raft of measures to be implemented by 2016 that include: upgraded monitoring systems; full pre-commitment for all EGMs in all jurisdictions; imposition of cash input limits; and changes to individual machines that enable them to provide a dynamic cost of play, warnings of unsafe play, an internal bank for wins over \$300, and limits of \$1 per bet. The exceptions for small venues are to end by 2018 and the effectiveness of the whole system is to be evaluated by 2010 (for a summary see Productivity Commission, 2010, p. 41, Table 1). The idea here is to make EGM gambling safer for frequent consumers. These recommendations are all about managing behaviour at the point of exchange – after people have visited the venues.

However, recommendations about *geographic* accessibility were not made. The only finding in this context was that lifting the ban on EGMs in the Canberra Casino was unlikely to result in increased gambling related harm. Instead, the Commission chose to focus on temporal accessibility. Specifically, the Commission found that mandatory shutdowns for EGM venues were too short to reduce harm and recommended (p. 14.1) that governments draw on the Queensland approach to introduce a shutdown period for gaming machines in EGM venues (apart from casinos) of at least six hours duration (Productivity Commission, 2010, p.59). Here the Commission has identified

an important component of accessibility (and a full discussion is presented from pages 4.21 to 14.27 of the report), one that is consistent with its previous discussions of the multi-factorial composition of accessibility (Productivity Commission, 1999) as well as more recent evidence that links problem gambler venue choice to opening hours (Hing & Haw, 2010). This approach recognises that EGM venues are highly dynamic in a temporal sense, and markets are both spatially and temporally stratified (Doran & Young, 2010a; Young, Lamb, & Doran, 2009, 2010).

At one level the lack of accessibility recommendations is surprising given that there is a generally well documented link between physical access or proximity to a venue and gambling behaviour (see reviews by Delfabbro, 2008; Young & Tyler, 2008). Leaving problem gambling to one side for a moment, there is evidence that geographic proximity is an important determinant of EGM demand. Indeed, the Commission's own analysis found a positive linear relationship between expenditure per machine and the density of EGMs at the jurisdictional level for 1998-99, 2006-07 and 2008-09. This general finding has been reinforced by several local level studies listed by the Commission in Appendix I of their report. Of course, of greater policy concern than EGM expenditure per se is the amount that is derived from problem gamblers in the population. The Commission is directly concerned with the relationship between accessibility and gambling harms (generally defined as a measure of problem gambling). As the Commission report (2010, p.14.3) states:

A threshold policy question is the existence and extent of any link between the accessibility of gaming machines and gambling harms. The existence of a strong link would, *prima facie*, suggest a need for regulators to be cautious in increasing the accessibility of gaming machines.

The available evidence does demonstrate such a link. For example, the Commission's (1999) report on Australia's gambling industries identified a correlation between EGM density and the level of problem gambling across most Australian jurisdictions. At the time this finding was reinforced by findings emerging from overseas (Campbell & Lester, 1999; Ladouceur, Jacques, Ferland, & Giroux, 1999; Lesieur, 1992; Lester, 1994; Shaffer, Hall, & Bilt, 1999; Volberg, 1994). In more recent Australasian research, a national-scale study conducted in New Zealand linked residential proximity to EGM venues directly with higher levels of problem gambling (Pearce, Mason, Hiscock, & Day, 2008). In a report released at the time of writing found physical access to be a significant risk factor for problem gamblers in treatment (Hing & Haw, 2010). In the context of specific venues, research from overseas has linked residential proximity to casinos with increased levels of problem gambling, although the results of these studies have not been entirely consistent (Adams, Sullivan, Horton, Menna, & Guilmette, 2007; Gerstein, Volberg, Murphy, & Toce, 1999; Welte, Barnes, Wiczorek, Tidwell, & Hoffman, 2007; Welte, Wiczorek, Barnes, & Tidwell, 2006; Welte, Wiczorek, Barnes, Tidwell, & Hoffman, 2004).

In the light of these findings, we could question why the Commission did not place greater emphasis on geographical accessibility to EGM venues. The answer lies in the fact that a general link between proximity to EGMs venues and gambling-related harm is not easily translated into effective harm-minimisation strategies. As the Productivity Commission (2010, p. 14.38) write:

Even with modifications, restrictions on caps, operating hours of gaming machines and other restrictions on accessibility are unlikely to be as effective as other harm minimisation

measures, including the Commission's pre-commitment proposal. This is primarily because small changes to accessibility (across its varying dimensions) would make little difference to the overall accessibility of machines in most jurisdictions.

Here the Commission argues that there are other, more effective, harm minimisation measures (such as bet limits and pre-commitment) that take precedence over accessibility concerns, at least of the magnitude that would generate improved social outcomes. In the Commission's view, supply-structures are certainly not a front-line of defence. Given "governments define the terms of access" the reasons for leaving geographic accessibility on the back-burner demands further scrutiny.

### **Impediments to the reconfiguration of supply**

The biggest hurdle faced in any reconfiguration of supply has to do with the fact that EGMs have reached a spatial saturation point. By this I mean that their spatial distribution is as extensive as the existing infrastructure networks of pubs and clubs will allow, bar of course Western Australia. Therefore, undoing this distribution is an enormous and politically challenging, if not impossible, task. The horse has already bolted as it were. This means we are stuck with 'venue-based convenience gambling' and the post-hoc challenges of trying to minimise the harm it causes. The Productivity Commission (2010, p. 30) clearly recognise this:

In the 1990s, most Australian jurisdictions liberalised gambling. High-intensity gaming machines were rapidly introduced throughout the community. In retrospect, given the harmful effects that ensued, a different model of liberalisation centred on destination rather than 'community' gambling may well have been more appropriate. However, it would be difficult and impractical now for any Australian government to suddenly reverse long-standing arrangements. (Some overseas jurisdictions have done so — Russia and Poland to name two — but they reflect different cultural contexts.) Only Western Australia adopted a model of destination gaming through a single casino — and the evidence supports it maintaining that model.

Adding to daunting task of confronting an entrenched political-economy of EGM gambling (Livingstone & Woolley, 2007) is the sheer magnitude of change that would be required to alter *accessibility patterns* as opposed to EGM numbers *per se*. Accessibility is not about the number of machines, but their distribution across space and time relative to particular communities (Young, Tyler, & Lee, 2007). Changing the supply structure can affect gambling outcomes – although only if the spatial distribution of supply is significantly altered. In other words, a reduction in accessibility would mean a reduction in the number of venues rather than a reduction in the number of machines across the same distribution of venues. It is for this reason that the destination-style gambling model explored by the Victorian government was not adopted (Victorian Department of Justice, 2008). The complete removal of EGMs from venues is simply not on the political agenda. However, while the closing of some venues in favour of fewer centralised venues would be politically untenable, the reduction of total EGM numbers across all venues in a particular region or area has proven less so, particularly where those areas are defined as socioeconomically

disadvantaged. Therefore, a concern with EGM capping policies has been the main foray into supply-side regulation. It is to these regional caps policies that I now turn.

### **The lessons from the regional caps policies**

Various jurisdictions have introduced caps at the state, regional, and venue level (see Productivity Commission, 2010, p.14.9, Table 14.1). The regional caps in particular have been based on a well documented link between socioeconomic status and the supply of gambling opportunities. It has been recognised for some time that poorer areas tend to be more heavily provisioned with EGMs and thus have higher levels of accessibility (Doran, McMillen, & Marshall, 2007; Gilliland & Ross, 2005; Marshall, 1999, 2005; Marshall & Baker, 2001a, 2001b, 2002; Marshall, McMillen, Niemeyer, & Doran, 2004; Productivity Commission, 1999; Robitaille & Herjean, 2008; South Australian Centre for Economic Studies, 2005; Wheeler, Rigby, & Huriwai, 2006; Wilson, Gilliland, Ross, Derevensky, & R., 2006). The logic driving regional capping policies is that socioeconomic status may be used as a surrogate for gambling vulnerability. By this logic, a reduction in the number of EGMs in low socioeconomic status areas (generally defined by the Australian Bureau of Statistics (ABS) Socioeconomic Indicators for Areas (SEIFA) indices) would afford some protection to vulnerable consumers by decreasing availability (Victorian Department of Justice, 2006).

However, these capping initiatives have not produced demonstrable improved social outcomes. The Commission reviewed various caps as the major form of accessibility control (mainly at jurisdiction and regional, and venue scales) and found them to be largely ineffectual:

There have been some (modest) reductions in state-wide caps on gaming machines – generally with strong community support. However, there is little likelihood that the ‘tinkering’ with caps has materially reduced accessibility or the harms from gambling. Unsurprisingly, the evidence suggests that the tougher caps instituted so far have mainly led to higher utilisation of the remaining stock of gaming machines, without affecting overall spending. Nevertheless, on precautionary grounds, this does not mean that caps should be relaxed or removed (Productivity Commission, 2010, p.30.)

More tellingly.....

The complexity of the impacts of caps on gamblers confirm that they are blunt and largely ineffective instruments for addressing gambling harms, particularly given the already widespread availability of gaming machines in most jurisdictions” (Productivity Commission, 2010, p 14.11)

This experience with regional caps raises questions about accessibility as a form of gambling management. As the Productivity Commission rightly point out, a key issue is that of the causal relationships between supply and demand. On one hand, there is more demand for EGMs from low socioeconomic status areas because EGM use is class-patterned, but on the other, increased supply can induce demand through increased accessibility and convenience gambling. However, I argue that the general direction of causation is not really the issue here. Causal relationships

are multi-directional, complex, and mediated by a range of factors (Young & Tyler, 2008). While proximity to gaming venues is related to problem gambling, the strength of this relationship is susceptible to contextual variations. For example, EGM demand is related to size and type of venue, location (i.e. proximity to shopping centres, residential areas or transport corridors), the range of other facilities offered, access to a wide catchment, seasonality, marketing campaigns, opening hours, and local strategies to ameliorate gambling impacts (McMillen & Doran, 2006, p.15). The primary reason for this local-level variation is related to mobility – people travel to particular venues outside their local area (Doran, et al., 2007; Marshall, et al., 2004; Young & Tyler, 2008). As a consequence, we are unable to make grand assumptions based on socioeconomic status alone, and this means that regional capping policies are on shaky ground. As a critical review by Young and Tyler (2008, p.50) concluded

...(S)upply structures and their relationships to problem gambling have been poorly understood, although this has not prevented their somewhat questionable translation into regulatory regimes, notably in machine relocation policies. The simplistic assumption behind these initiatives is that problem gambling can be reduced to a linear effect of association between gambling exposure (or supply) and the distribution of gambling opportunities among disadvantaged populations. However, the assumptions contained in this formulation can be shown to be based on either a faulty logic or uncertain and problematic causal sequences.

This puts policy makers in a difficult position. On one hand, they require a strong link to justify evidence-based policy making (Banks, 2009). On the other, there is not enough empirical clarity, nor is there likely to be, in support of broad-based policies of supply reduction at a jurisdictional scale. Political will to change supply structures to the magnitude that affects social outcomes would need an absolutely convincing evidence base, far more convincing than currently exists. The answer to this problem, I suggest, lies in more nuanced analysis of accessibility at the local scale.

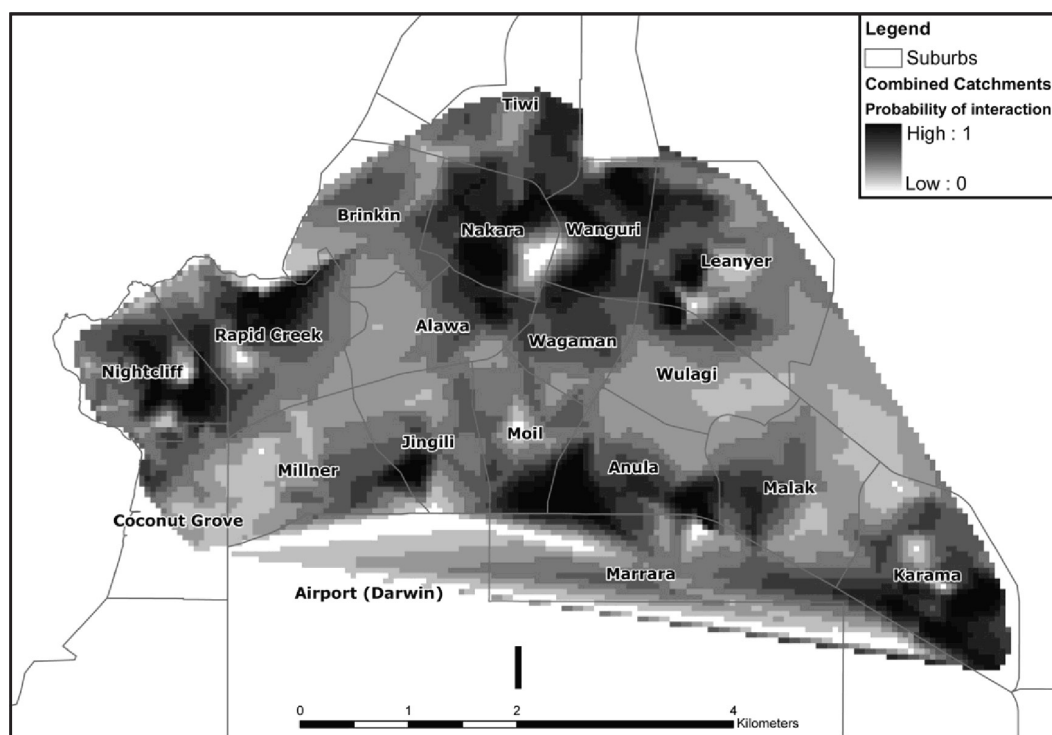
### **The case for local-level accessibility studies**

Previous approaches to measuring accessibility conducted by the Commission and others (e.g. number of EGMs per 1000 people) have been limited. There has been a tendency to look at large scale correlation between problem gambling levels and the number or density of EGMs or more specific post hoc effects of casinos. Neither of these approaches are particularly useful to regulation, as they do not inform decisions about individual EGM venues at the local level. If geographic accessibility is to be meaningfully used as a policy parameter we need to examine accessibility at specific localities in a way that allows policy makers to make locally-appropriate decisions. As the Productivity Commission (2010, Appendix I. p. 115) point out:

The results support a link between gaming machine density and problem gambling prevalence rates. The aggregate and time series studies suggest that accessibility is causally-related to problem gambling. However, for small area studies, the relative strengths of the two links between accessibility and harm has not yet been considered rigorously.

The real question, I would contend, is how we bring together both supply and demand in predictive models of gambling-harm at the local level. In Australia, this means we need to know the local impacts in different geographical and social contexts of particular venues and clusters of venues, be they clubs, pubs or casinos (Young, et al., 2009).

Recent advances in the field of GIS have allowed this. In the Australian context, a recent application of gravity modelling by Doran and Young (2010b) produced a predictive spatial catchment of EGM venues for local areas (in this illustrative case the northern suburbs of Darwin, Northern Territory). Figure 1 presents a combined predicted catchment of all the EGM venues in this area, an output developed using both residential distance from venues and a measure of venue size or attractiveness. The advantages of this model is that it is a generic one that may be applied in other urban settings and can be produced using only existing data. Moreover, the venue catchment outputs (Figure 1) may be combined with the traditional ABS SEIFA variables (Figure 2) to produce what amounts to a gambling vulnerability surface (Figure 3). The gambling vulnerability surface effectively incorporates both supply (i.e. catchments) and demand (i.e. socioeconomic status) at the local level of analysis – directly suitable for regulatory decision making. A strength of this approach is that it is, unlike regional capping approaches, is no longer based solely on SEIFA as the primary predictor of gambling vulnerability, but also incorporates venue catchments (Doran, et al., 2007; McMillen, 2006).



**Figure 1.** Combined EGM Venue Catchment for Northern Darwin  
 Source: Doran and Young (2010b, p.149)





**Figure 2.** The SEIFA index of advantage–disadvantage for Northern Darwin  
Source: Doran and Young (2010b, p.146)



**Figure 3.** Gambling vulnerability surface for Northern Darwin  
Source: Doran and Young (2010b, p.150)

Doran and Young (2010) argue that these 'gambling vulnerability' surfaces may offer an opportunity to significantly improve EGM regulatory decision making both in terms of specific licensing decisions and harm minimisation strategies more generally. As a general technique this form of GIS modelling:

- combines local patterns of access with socioeconomic status to map gambling vulnerability at a level that is entirely locally-relevant
- can be run using secondary data available from the ABS and licensing agencies making it cost-effective and amenable for use by local agencies such as local Councils
- is amenable to a range of more sophisticated extensions including calibration, use of various attractiveness measures, and use of road distances
- may be applied to other sorts of gambling-related venues (e.g. TABs and newsagents)
- may be used as a community planning or engagement tool where outputs are presented to informed groups such as venue managers, regulators, community service organizations, and local residents
- may be applied at jurisdiction-wide scales

In terms of individual licensing decisions, the model outputs have specific social impact assessment applications. For example, the outputs can predict the likely social impact of the introduction of new EGM venues, an increase in number of EGMs in existing venues, or the relocation of existing machines. The model outputs can also help in determining vulnerability 'hotspots' that warrant more detailed investigation. More broadly, different alternative supply-side configurations may be modelled in a scenario assessment approach. In a social service context, the outputs can help determine where to target awareness, education, and promotional campaigns, locate counselling and intervention services, and suggest localities for the redirection of community-grant schemes.

These applications are all consistent with the Productivity Commission's (2010, p. 14.20) preferred principles of a precautionary approach to EGM harm, that include:

- no net detriment to community wellbeing
- closer assessment of impacts of EGMs in low SEIFA and other vulnerable communities
- extensive community input when EGMs introduced for first time, although not mandatory after introduction
- involvement by local Councils

My hope is that the GIS-based approaches I have outlined here and which are also emerging overseas (eg. Pearce, et al., 2008; Robitaille & Herjean, 2008; Rush, Veldhuizen, & Adlaf, 2007) will enable regulators to make more informed decisions when it comes to social impact assessment of EGM venues. Again, this is consistent with what the Productivity Commission appears to be leaning towards:

Processes that allow for the assessment of local impacts, or give some capacity to communities to control the number of gaming machines in their local areas, could be viewed as a 'bottoms-up' approach to controlling accessibility to gaming machines (Productivity Commission, 2010, p. 14.17).

The more common adoption of local accessibility studies and methods may start to transfer some control over EGM licensing decisions into the hands of local communities and political entities, allowing for gradual change in particular progressive areas. For example, the recent case of

Romsey made clear that local communities can affect the decisions of the state judicio-political apparatus. Again, in the words of the Commission (2010, p. 14.38):

Reducing the number of venues providing gaming machines in a particular area could be seen as a useful transition to a model of accessibility centred on destination gaming rather than community-wide gaming. Governments should consider undertaking further research on the impacts of such an approach, and it would be consistent with a capacity for local governments to have a voice in decisions about accessibility to gaming machines in their communities (section 15.3).

## **Conclusions**

The central problem when considering geographic accessibility as a tool for harm minimisation is that the causal relationships between gambling supply, demand, and social outcomes are mediated by a range of variables at the local level. This results in considerable local level and complexity and variation. Unfortunately, most of the research conducted to date has not been sophisticated enough in its approach – focussing in the main on large-scale general associations between accessibility and harm. Until we capture this complexity at a local level we will be unable to regulate effectively from a supply-side perspective. Rather than looking at aggregate relationships between supply and outcomes at the jurisdictional level, we need to look more locally at types of venues and their dynamics within specific geographical contexts. Recent advances in GIS have started to address this problem, making possible local predictive models that may be used to regulate at the level of the individual venue. The outcome of the current suite of projects in GIS of venues will be a calibrated predictive model that can be used at a jurisdiction-wide scale. We certainly need to explore this area of local accessibility far more comprehensively than has been done and using the increasingly sophisticated research tools at our disposal – and this is an agenda that the Productivity Commission appears to fully support and indeed encourages. Indeed, supply configurations and geographic accessibility may yet be on the agenda depending on how political processes around maximum bets and pre-commitment play out. The real challenge for accessibility regulation is how to translate research into policy at the local level that is politically tenable. As the Productivity Commission points out:

There are clearly different approaches ... to considering local impacts from the introduction or expansion of gaming machines. A proper resolution of the most appropriate approach would require more detailed analysis than is possible in this inquiry and, perhaps, more time to gain further evidence (Productivity Commission, 2010, p. 14.20).

The time is ripe for such consideration. To this end I have presented one possible alternative from GIS-inspired approaches in this review. I argue that we need a raft of measures on both the demand and supply side if we are to effectively minimise the harm associated with EGMs and to start to empower local communities and organisations in the decision-making process. GIS capabilities across government and local councils may make the adoption of locally-attuned predictive modelling an invaluable addition to this agenda.

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