Keeping Blue Collars in Green Cities: From TOD to TOM?

Yonn A. Dierwechter* and Mark Pendras

School of Urban Studies, University of Washington Tacoma, Tacoma, WA, United States

Building on work that critiques smart growth's "industrial blind spot," we explore here the potential for “transit-oriented manufacturing” (TOM) rather than transit-oriented development (TOD) in order to gain some purchase on visions for green city futures that include blue collars workers. The shift from TOD to TOM, we argue, involves some rethinking of what (and who) cities are for, and paying careful attention to how investments in transit infrastructure serve to define, materially and symbolically, urban and regional relations and identities. Through an engagement with the scholarship on planning for urban industry, smart growth, and transit-oriented development, we argue that the first challenge is to make TOM thinkable. By this we mean not only how we abstractly imagine or conceive future worlds, but also how we create and deploy practical vocabularies of deliberated urban change that actively help to mobilize new conversations about critical places in our changing and changeable cities and regions. We link this challenge of the “thinkability” of TOM to a brief case study in the city of Tacoma, WA.

Keywords: smart growth, inclusive development, transit oriented development, industrial development, planning

INTRODUCTION

In their 2012 article in the *Journal of the American Planning Association* (“Smart Growth’s Blind Side”), Nancy Green Leigh and Nathanael Hoelzel spotlighted a hole at the center of one of the profession's most popular and promising concepts. Smart growth, they argued, was blind to the contributions traditional industry could make (and had made) to the vibrancy and sustainability of cities. Without ignoring the long legacy of environmental problems, or pretending that manufacturing was poised to recapture the glory days of yore, Green Leigh and Hoelzel (2012, p. 88) revealed the barriers to industrial vitality commonly introduced by smart growth plans:

[S]mart growth discourse in planning practice narrowly perceives sustainable land use and economic development as promoting non-industrial activities over industrial activities... Smart growth policies offer little guidance to cities that are losing productive industrial land essential to supporting industrial firms and jobs and preventing industrial sprawl. Likewise, by not encouraging industrial revitalization in mixed-use, transit-oriented, and infill redevelopment projects, smart growth policies overlook a significant economic sector that contributes to diverse, innovative, and more resilient local economies.

As we take up their challenge of “acknowledging the lack of attention to issues and priorities for revitalizing urban industry in the smart growth movement” (p. 88), we are particularly attracted to their question about “transit-oriented” development. For the creation of transit infrastructure has a unique capacity to shape city futures, to quite literally initiate and/or solidify path dependencies. And nowhere, we argue, is the “blind side” of smart growth more apparent than in transit-oriented development (TOD) research and practice. “Keeping blue collars in green cities” is clearly a much
wider planning and development challenge than just transit policy, involving workforce training programs, national economic development strategies, brownfield remediation approaches, and a myriad of other interventions.

Our empirical focus here on rethinking TOD to include blue-collar lives is intended as a first step in this research stream, connecting with a planning paradigm that has gained widespread popularity, and, indeed, power, over the past two decades. Whereas, individual building conversions and large-scale plans to re-zone industrial areas for commercial and residential uses attract negative attention for the openness with which they fuel real-estate speculation, TOD maintains a sheen of progressive sustainability. And though recent studies reveal TOD’s tendency to contribute to gentrification and displacement, the green themes of trip-reductions, increased housing densities, and pedestrian-friendly environments often push TOD beyond the reach of critique. As more cities grapple with the inequalities that accompany orthodox “green” and “creative” city plans and visions, we want to think more critically about the composition of our “green cities.”

We thus explore here the potential for “transit-oriented manufacturing” (TOM) to gain some purchase on visions for green city futures. The shift from TOD to TOM, we argue, involves some rethinking of what (and who) cities are for, and paying careful attention to how investments in transit infrastructure serve to define, materially and symbolically, urban and regional relations and identities. Through an engagement with the scholarship on planning for urban industry, smart growth, and TOD, we argue that the first challenge is to make TOM thinkable. By this, we mean not only how we abstractly imagine or conceive future worlds, but also how we create and deploy practical vocabularies of deliberated urban change that actively help to mobilize new conversations about critical places in our changing and changeable cities and regions. We link this challenge of the “thinkability” of TOM to a brief case study in the city of Tacoma, WA, a port city with substantial industrial competencies and industrial land that is now facing mounting redevelopment pressures emanating directly from “high-tech” Seattle and King County. The essay concludes with some reflections on what a shift from TOD to TOM involves, conceptually, and what that shift might mean for contemporary and future planning practice.

**PLANNING FOR URBAN INDUSTRY**

As dramatic tales of deindustrialization have filled academic books and journals for decades, they scarcely warrant repeating here. Cities around the world, but particularly in North America and Western Europe, saw their economic fortunes change during the second half of the twentieth century as traditional industries relocated to suburban, rural, and/or overseas locations (Blustone and Harrison, 1982). The abandoned landscapes and social and economic damages left behind have been well-chronicled (Massey and Meegan, 1982a,b; Sugrue, 1996; Linkon and Russo, 2002). In addition to a great deal of pain and suffering, that long moment of industrial upheaval inspired new visions for cities as post-material spaces, or spaces that privilege and prioritize services, entertainment, and other forms of consumption over the production of material goods (Zukin, 1991, 1998; Judd and Fainstein, 1999; Clark, 2011). Decades on, as the dust has settled after the chaos of urban crisis, two insights have emerged that warrant special attention: (1) “de-industrialization” and/or post-industrial transition has not been as abrupt or as final as the language implies; cities remain spaces of production, if to a lesser degree, and heavy industry and manufacturing continue to thrive in many cities, despite operating in generally antagonistic cultural and political climates; and (2) the urban development strategies employed to remedy cities’ post-industrial ailments have contributed significantly to a rise in social and economic polarization, both between cities and within cities. In short, research suggests that continuing to push manufacturing from cities in search of more verdant futures is both unnecessary and undesirable.

While our focus here is on the US context, these same patterns have been expressed throughout the Global North, though in variegated ways.

In questioning the necessity of deindustrialization, we are reminded that deindustrialization was never a neutral response to the natural workings of the market, but rather instead a deeply political process with clear winners (real estate investors and corporate elites) and losers (traditionally industrial workers, cities, and neighborhoods) (Blustone and Harrison, 1982; Massey, 1994). This is especially evident when we shift attention from neutral representations of “industrial transition” to active policies of industrial displacement. As (Curran, 2004, 2007) has demonstrated in relation to New York City, despite common representations to the contrary, the loss of a viable manufacturing sector may not be so much a consequence of competitive disadvantages and the “self-expansionary” logic of the postindustrial economy as it is an outcome of local politics and land use policies that have privileged some actors over others. In many cases, the anticipation of future demands contributes to the displacement of otherwise viable industrial sectors through such developments as zoning changes that eliminate space for manufacturing, and development programs and policies that not only ignore manufacturing but actively support the land uses against which manufacturing sectors compete (condominiums, high-tech offices) (Zukin, 1989; Rast, 1999, 2001; Leigh, 2013; Wolf-Powers, 2013; Christopherson et al., 2014). In this regard, urban industry is not simply a “blind spot” that planners inadvertantly overlook but rather a presumed “dead spot” to be regenerated. The presumption that industry is either already gone for good, soon will be, or, even worse, should be, becomes a self-fulfilling prophecy when zoning and land use changes reduce the space available for urban industry.

The emphasis on politics is important. For the political—questions of power, influence, competing interests, and visions—also shapes perceptions of urban industrial desirability. As noted above, whether it be as FIRE platforms or creative class utopias, cities (at least putatively “successful” cities) have been thoroughly reimagined in recent decades as spaces for entertainment, consumption, and professional services. This much is, by now, axiomatic. But the post-material assumptions and attendant political dynamics that marginalize and disadvantage urban manufacturing interests contradic...
emerging research highlighting the various ways many manufacturing firms thrive in cities and often help to fuel economic activity in other sectors (Ferm and Jones, 2017; Hatuka et al., 2017). In addition to employing over 12 million workers nationally (Leigh et al., 2014), specifically urban manufacturers in cities like New York, Chicago, Milwaukee, Los Angeles, San Francisco, and many others utilize the relatively high population densities, and well-developed transportation infrastructures, supplier and consumer networks, and worker availabilities to bring diversity and dynamism to their local economies (Hatuka et al., 2017). This also helps to advance a more balanced and inclusive local economy. As Luria and Rogers (2007, p. 2) put it:

[Manufacturing jobs] provide an entry to the middle class for millions of non-college-educated workers, including a disproportionate share of non-white workers. They anchor high-end service jobs, especially in cities, and thus provide a multiplier on community prosperity and general living standards. They are a motor for the demand and application of new technology, upon which living standards finally depend. And they are essential to achieving balance, or at the least less imbalance, in U.S. trade with the rest of the world.

Manufacturing jobs also pay “significantly higher wages for blue-collar workers lacking a college education than other sectors” (Leigh, 2013, p. 324). When these positions vanish and are replaced by tech-oriented professional services positions and/or low-end service jobs in retail and entertainment, the health benefits and opportunities for growth and advancement typically attached to these positions also fade, leaving cities to struggle with questions of social justice and equity.

The planning blind spot that presumes and facilitates the decline of urban industry thus clearly conflicts with the many indications that suggest urban industry remains strong, vibrant, and, indeed, vital to many urban economies (Lester et al., 2013; Ferm and Jones, 2017). When imagining new spaces of production here, we have in mind urban-scaled, advanced manufacturing activities that little resemble the iconic smokestacks of traditional industrialism. Arguments in favor of urban industry are therefore not about getting “back to” some idealized past but rather investing in desirable futures that value at least some semblance of equitable development; this is less about nostalgia than it is about taking seriously the socio-economic consequences of envisioning cities as post-material spaces. For one pattern from recent decades comes through very clearly: post-material cities are unequal cities (Wolf-Powers, 2013; Mallach, 2015). As we challenge outdated assumptions and stereotypes about how manufacturing looks (big and dirty), operates (slow and conservative), and fits with the modern economy (at odds with visions for urban sustainability), the task is to find ways to weave spaces of production into the visions that already animate planning imaginaries. We briefly take up that challenge below by engaging critically with the concept and practice of TOD, using Tacoma to illustrate key themes.

**RETHINKING TOD IN SMART GROWTH PLANS: TOM IN TACOMA**

The pursuit of green cities through specific forms of smart growth, including regionally coordinated TOD investments, represents one of the signature themes in recent urban planning discourses, especially in North America (Dierwechter, 2017; Riggs and Chamberlain, 2018). Celebrations and critiques of TOD thus reflect wider celebrations and critiques of smart growth and local planning institutions (even though these concepts are not the same). Urban scholars of planning evaluate smart growth and TOD on their own terms, but also from wider analytical frameworks, theoretical perspectives, and modes of thinking (see, e.g., Dierwechter, 2017). In consequence, extant readings of the kinds of “spaces that smart growth” makes—including TOD spaces—have ranged from breezy celebrations of partial successes to far more reserved critiques of presumed limits, omissions, failures, and practical obstacles (Dierwechter, 2014).

Recent concerns and critiques in the urban planning literature offer a valuable “rethinking” of TOD in smart growth plans. Though broadly sympathetic, (Chapple and Loukaitou-Sideris, 2019) new book on the “dark side” of TOD and “smarter growth” policies, for example, explores how to counter its often unintended “displacement effects” on disadvantaged populations. Housing and gentrification effects are also prominent themes in a helpful survey of the current state of TOD research published recently in the *Journal of Planning Education and Research* (“TOD @ 25”). Other key themes in this special issue address the various meanings of the “D” in TOD research, including density, diversity, design, destination, distance, and demand. However, the special issue’s most relevant paper for our purposes here examines the impacts of TOD on “innovation in the creative and knowledge industries,” suggesting more work is needed on the “economic development outcomes of TOD” (Zandiataashbar et al., 2019, p. 431). We agree, particularly with the claim that a “missing link” pervades thinking about TOD “places” and questions of “productivity” (ibid.). But we remain concerned that even this emerging body of impressive work falls short of imagining how blue-collar lives and spaces of production—rather than just consumption, residential change, or the creative class—fit into future urban and regional relations and identities. For this reason, we argue that rethinking TOD in smart growth plans may require us to more explicitly and deliberately shift our language to TOM in cities like Tacoma. This shift acknowledges that TOD suffers from more than a blind spot. Putting blue collars back into green cities means addressing TOD’s dead spots, wherein planning for industry through TOD has strangely become unthinkable.

How did this happen, and what can we do about it as we explore “new frontiers” in urban sustainability? The emergence of TOD in the 1990s coincided with a rising urban narrative of post-Fordist change that envisioned North American cities (like Tacoma) as still-embryonic post-material spaces: someday-future-worlds of waterfront funscapes and play parks, yacht basins, infill condos, trendy museums, the
cash-rich cognitariat, entrepreneurial hipsters, and convention centers. In consequence, the “development” that ought to be “transit-oriented” (or “transit-linked,” as it was initially called) was and continues to be imagined as consumption-oriented. Reproduction needs in turn have typically included mixed-use housing complexes and specific kinds of ancillary services (e.g., doggie daycare, sushi bars). Either way, the “development” oriented around, or linked with, pro-transit space was and too often remains demonstrably post-material.

One practical example of how powerful narratives have worked to limit local planning imaginaries—even urban thought itself—is a recent consultative report for the North Central Texas Council of Governments and the City of Cedar Hill, Texas (Clarion Associates, 2014). The report provides “…a smart growth audit of the city's zoning ordinance followed by recommended revisions to ensure it supports TOD around the new station” (p. 1). Recommended zoning revisions include now de rigueur elaborations of “allowed” principle uses “by Right (P)”; with “Special Use Permit (S)”; and of particular interest here, “Prohibited (X)” for both the future “TOD core” and the “TOD ring” (p. 16). While parking lots and parking structures are allowed in the report “by Right (P)” or with “Special Use Permits (S)” in both the core and the ring, “industrial service uses,” “manufacturing and production uses,” and “warehousing and freight movement uses” are eX’ed-out. Production is banished by the banal legalism of zoning to the elsewhere places of cities; to the temporal yesteryears of history; to the spatially segregated frontiers of blue collars.

Industrial cities like Tacoma—and Tacoma, like many cities, remains a city with industry—should (and can) challenge dominant TOD narratives like this one by actively rethinking the “development” part of TOD to include production. Indeed, shifting the conversation from TOD to TOM might be a practical way for planners and other officials to help communities rethink urban development strategies that can pragmatically confront both social and economic polarization. Put another way, TOM might provide cities with a way to embrace the definition of sustainability that preserves “equity” as a core value, while also avoiding the out-of-sight out-of-mind fantasies that fuel visions of the post-material city.

Now is the time to take up these questions in Tacoma. Many readers will be undoubtedly familiar with the city of Seattle and the tech boom ushered in by the likes of Microsoft and Amazon and the myriad other tech firms and spin-offs that constitute its tech agglomeration. Fewer will recognize the “regional second city” (Pendras and Williams, forthcoming) of Tacoma, located some 35 miles to the south. Embedded firmly within Seattle’s tech agglomeration shadow, Tacoma has maintained its “gritty” industrial character and composition despite the transformations that have beset the region. But as the Seattle boom continues and residents are pushed and pulled by mounting diseconomies to relocate, Tacoma is facing new development pressures. The passage, in 2016, of a regional transportation bond authorizing Sound Transit, the regional transit planning agency, to expand the regional light rail network to connect the cities of Seattle and Tacoma adds a new dimension to this dynamic and brings the challenges of planning for urban industry into sharp relief. As of late-2019—after a series of working groups, public meetings, scoping sessions, and consultant reports—station stops have been selected, including two key stations in the port-Tideflats area of Tacoma. For the purposes of this article, these stations are “key” because they are located in the city’s (currently) industrially zoned core, raising questions about how new transit developments will (and should) connect the city’s current configuration with next-step imaginaries. The timing is perfect, in other words, for investigating whether and how transit investments might mesh with existing and potential industrial futures.

Preliminary reports offer evidence of both business-as-usual TOD practice and, importantly, acknowledgment of and value for existing industrial activity. For example, included in the TOD advisory group that has been assembled to help shape the local planning efforts is a representative of the “Freight/East Foss Industrial Community,” ensuring at least some voice for the industrial actors. Similarly, an introductory briefing book published by the Urban Land Institute envisions three components of the project: a traditional mixed-use TOD in one area; an entertainment district in another area; and then the preservation of existing industrial uses in a third section. This kind of language suggests that TOM is at least thinkable within the parameters of this project; industry is not quite in the planning “dead spot” it so often otherwise occupies in the TOD literature.

But before we celebrate too heartily, we need to recognize that industry still exists on the margins of the discussion here. The primary emphasis of preliminary documents falls firmly into well-worn planning patterns by clarifying that “the Dome District is transitioning to a TOD housing and entertainment hub, and it is a critical time for decision-making that will have significant impact on the District’s future” (City of Tacoma, 2019, p. 6). We couldn’t agree more that this is a critical time for determining the District’s future. But the eviction of the previous industrial language from the “transitioning” vision points to the importance of bringing the TOM concept more firmly into the discussion. If the area is to maintain its role as a “convergence point for the regional workforce, visitors, industrial transport and multimodal travelers,” then planners and others involved in the project will need to do more to ensure a successful transition from TOD to TOM.

**CONCLUSION**

To be clear, by engaging critically with TOD, we are not suggesting that the concept is fatally flawed. Like most ideas, the challenge is in the application, and the difficult questions explore the links between benefits and consequences. We fully recognize that pushing for any type of transit-oriented investments in the US context involves a considerable amount of swimming upstream. Nevertheless, the path dependencies fixed in place by new transit infrastructures warrant careful and critical attention to ensure that the futures being inscribed on the urban landscape are thoughtfully enacted to achieve balance and inclusion. If we fail to expand the concept of TOD beyond a narrow emphasis...
on the residential and commercial, then not only do we fail to make room for important components of the urban fabric, but we undermine support for an otherwise promising planning tool by leaving it exposed to justifiable critique.

Our intention here has been to take up the challenge of equitable development by exploring specific and practical ways to keep blue collars in green cities, building from recent scholarship that points to the continued vitality of urban industrial sectors and the role of industrial jobs in providing well-paying entry-level jobs with opportunities for social mobility. Again, the wider challenge of imagining and building “green cities” both with and for actually existing people in communities who labor, produce, make, fix, and/or repair for a living spills well-beyond TOD questions. Yet, one critical strategy for achieving this overall goal, we have argued, is to recognize and confront the planning practices that typically discourage and displace urban industry (TOD) and to explore new practices that actively include industry in green city imaginaries. In terms of planning practice, the first step is to make TOM “thinkable,” to bring it into the realm of possibility, by demonstrating its conspicuous empirical absence from current planning practices and articulating its normative and theoretical desirability. Clearly, this is just a beginning and much more work is needed in other urban policy arenas. We will take up this work by concentrating an upcoming planning studio course in our Masters in Community Planning degree program on the Tacoma case study, guiding students through the task of assembling the data needed to effectively envision and execute the TOM strategy. Findings from this work will then inform next steps—planning reports, workshops, zoning designations—that could help strengthen the case for creating and maintaining space for urban industry in green city futures.

**AUTHOR CONTRIBUTIONS**

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

**REFERENCES**

Bluestone, B., and Harrison, B. (1982). *The Deindustrialization of America: Plant Closings, Community Abandonment, and the Dismantling of Basic Industry.* New York, NY: Basic Books.

Chapple, K., and Loukaitou-Sideris, A. (2019). *Transit-Oriented Displacement or...* Cambridge J. Regions Econ. Soc. 7, 351–358. doi: 10.1093/cjres/rsu023

Clarion Associates (2014). *Mixed-Use Transit-Oriented Development Zone District Standards.* Available online at: https://smartgrowthamerica.org/app/legacy/documents/091814-final-issues-and-options-paper-cedar-hill.pdf

Clark, T. N. (editor) (2011). *The City as an Entertainment Machine.* Lanham, MD: Lexington Book.

Curran, W. (2004). *Gentrification and the changing nature of work:* exploring the links in Williamsburg, *Brooklyn, Environ. Plan. A.* 36, 1243–1260. doi: 10.1068/a36240

Curran, W. (2007). *From the frying pan to the oven:* gentrification and the experience of industrial displacement in Williamsburg, *Brooklyn, Urban Stud.* 44, 1427–1440. doi: 10.1080/0020980701373438

Dierwechter, Y. (2014). The spaces that smart growth makes: sustainability, segregation, and residential change across greater Seattle. *Urban Geogr.* 35, 691–714. doi: 10.1080/02723638.2014.916905

Dierwechter, Y. (2017). *Urban Sustainability Through Smart Growth: Intercurrence, Planning, and the Geographies of Regional Development Across Greater Seattle.* Cham: Springer.

Ferm, J., and Jones, E. (2017). Beyond the post-industrial city: valuing and planning for industry in London. *Urban Stud.* 54, 3380–3398. doi: 10.1177/0042098016688778

Green Leigh, N., and Hoelzel, B. (2012). Smart growth’s blindside: sustainable cities need productive urban industrial land. *J. Am. Plann. Assoc.* 78, 87–103. doi: 10.1080/01944363.2011.645274

Hatuka, T., Ben-Joseph, E., and Peterson, S. M. (2017). Facing forward: trends and challenges in the development of industry in cities. *Built Environ.* 43, 145–155. doi: 10.2148/benv.63.3.145

Judd, D., and Fainstein, S. (editors) (1999). *The Tourist City.* New Haven, CT: Yale University Press.

Leigh, N. G. (2013). “Strengthening urban industry: the importance of infrastructure and location,” in *Infrastructure and Land Policies,* eds G. Ingram and K. Brandt (Cambridge, MA: Lincoln Institute of Land Policy).

Leigh, N. G., Hoelzel, N. Z., Kraft, B. R., and Dempwolf, C. S. (2014). *Sustainable Urban Industrial Development.* Planning Advisory Service Report No. 577. Chicago, IL: American Planning Association.

Lester, T., Kaza, N., and Kirk, S. (2013). Making room for manufacturing: understanding industrial land conversion in cities. *J. Am. Planning Assoc.* 79, 295–313

Linkon, S. L., and Russo, J. (2002). *Steeltown USA.* Lawrence: University Press of Kansas.

Luria, D., and Rogers, J. (2007). *Babies, Bathwater, and American Manufacturing: What’s Worth Saving and How.* Available online at: https://www.cows.org/_data/documents/1061.pdf

Malloch, A. (2015). The uncoupling of the economic city: increasing spatial and economic polarization in American older industrial cities. *Urban Aff. Rev.* 51, 443–473. doi: 10.1177/107088741537609

Massey, D. (1994). *Space, Place, and Gender.* Minneapolis, MN: University of Minnesota Press.

Massey, D., and Meegan, R. (1982a). *The Anatomy of Job Loss.* London: Methuen.

Massey, D., and Meegan, R. (1982b). *The Deindustrialization of America: Plant Closings, Community Abandonment, and the Dismantling of Basic Industry.* New York, NY: Basic Books.

Rast, J. (1999). *Remaking Chicago: The Political Origins of Urban Industrial Change.* DeKalb, IL: Northern Illinois University Press.

Rast, J. (2001). Manufacturing industrial decline: the politics of economic change in Chicago, 1955–1998. *J. Urban Affairs* 23, 175–190. doi: 10.1111/1735-2166.00082

Riggs, W., and Chamberlain, F. (2018). The TOD and smart growth implications of the LA adaptive reuse ordinance. *Sustain. Cities Soc.* 38, 594–606. doi: 10.1016/j.scs.2018.01.007

Sugrue, T. J. (1996). *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit.* Princeton, NJ: Princeton University Press.

Wolf-Powers, L. (2013). “Economic development: resolving the parallel universe dilemma,” in *Toward a 21st Century for All,* eds J. Mollencopf and B. Lander (New York, NY: CUNY Graduate Center).
Zandiatashbar, A., Hamidi, S., Foster, N., and Park, K. (2019). The missing link between place and productivity? The impact of transit-oriented development on the knowledge and creative economy. *J. Planning Educ. Res.* 39, 429–441. doi: 10.1177/0739456X19826271

Zukin, S. (1989). *Loft Living*. New Brunswick, NJ: Rutgers University Press.

Zukin, S. (1991). *Landscapes of Power: From Detroit to Disney World*. Berkeley, LA: University of California Press.

Zukin, S. (1998). Urban lifestyles: diversity and standardization in spaces of consumption. *Urban Stud.* 35, 825–839.

**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

*Copyright © 2020 Dierwechter and Pendras. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.*