



March 3, 2011

**VIA E-MAIL**

Ms. Linda Meng, Esq.  
City Attorney  
City of Portland  
1221 S.W. 4th Avenue, Room 430  
Portland, OR 97204

Re: Obstruction Review for Columbia River Crossing Bridge

Dear Ms. Meng:

Kaplan Kirsch & Rockwell has been asked by the City of Portland to advise on issues concerning the federal process for review of potential height and obstruction problems associated with alternatives for construction of a bridge over the Columbia River. This letter provides our initial review of the issues, with particular focus on the timeline needed for federal review of a proposed bridge for height and obstruction purposes.

By way of background, Kaplan Kirsch & Rockwell is one of the largest law firms in the nation whose practice is dedicated to transportation legal issues. We regularly represent airports and nearby landowners in matters concerning protection of the navigable airspace and have been involved in rulemakings, formal administrative processes, informal negotiations and litigation over airspace protection. We also represent local governments and other clients in compliance with federal regulatory (and local land use) requirements applicable to tall towers and other structures that could constitute obstructions to air navigation.

**Summary** — While this analysis is necessarily preliminary (and must remain so until detailed designs are available for the proposed bridge design), we conclude that the Federal Aviation Administration (FAA) review and processing time for a new bridge design should not take in excess of 60 to 90 days. The fact that there already exists an obstruction in almost (or precisely) the same location will simplify FAA analysis in this instance because existing airspace usage in the vicinity is already designed to avoid the existing bridge. If a new bridge structure is shorter (or even, potentially, slightly taller, depending upon precise location) than the existing bridge structure, FAA review may not be needed at all.

A bridge structure could possibly affect other airspace constraints. In particular, it is possible that a bridge could affect air carriers' emergency procedures for operations when one aircraft

Ms. Linda Meng, Esq.

March 3, 2011

Page 2

engine becomes inoperative. There is no formal process to determine whether there is an effect on such procedures without consulting individually with each carrier. Neither consultation nor approval is required before construction of a new structure.

## **FACTUAL BACKGROUND**

The States of Oregon and Washington are undertaking plans for a highway and light rail project that include a bridge across the Columbia River at approximately the location of the existing Interstate 5 crossing of the Columbia River. We understand that several alternatives have been proposed for the bridge portion of the so-called Columbia River Crossing project. These alternatives include three bridge types: a tied-arch, cable-stayed, or deck-truss design. The City of Portland has asked us to look at potential pre-construction schedule impacts that could arise out of the need for discussion with the FAA about the cable-stayed bridge design.

We understand that one of the objections to the cable-stayed design is that the structure could constitute a hazard to air navigation under applicable federal law and that, in light of that impediment, securing necessary reviews and approvals for a cable-stayed design could substantially delay the Columbia River Crossing project. Apparently the concern is based upon the proximity of the Columbia River Crossing (and the bridge in particular) to Pearson Field Airport and Portland International Airport (PDX).

***Review Panel Report*** — The *Bridge Review Panel Final Report* (Feb. 2011) makes a number of important observations and conclusions regarding the cable-stayed design for the proposed Columbia River Crossing:

- The cable-stayed design is “feasible with an accommodation of aviation requirements relating to Pearson Field. The Portland International Airport (PDX) airspace, however, is not impacted.” *Bridge Review Panel Final Report* at 33.
- The height of the towers for the cable-stayed design “would be set just below the control surface for PDX airspace.” *Id.* at 36.
- Permitting would be required for construction cranes because of controlled airspace in the area. *Id.* at 37.
- While the *Report* does not disclose precisely the height of the towers for the cable-stayed design, it appears from Figure 6 of the *Report* that the towers would be 160 feet above the deck level and 280 feet above the river surface, *id.* at 36, about 30 feet higher than the height of the towers under the tied-arch design. *Id.* at 53.

Ms. Linda Meng, Esq.

March 3, 2011

Page 3

- The proposed towers for the cable-stayed design would be “50 feet higher than the existing lift bridge towers but are to the south in less restricted airspace.” *Id.* at 38.
- The *Report* discusses the relationship between operations at Pearson Field and PDX and the existing bridge structure. *Id.* at 79-82. It notes that “the lift towers for the existing bridges are an encroachment into the available Pearson Field airspace,” *id.* at 80, but asserts that “a ‘grandfathering’ action has occurred to allow this situation to exist.” *Id.*
- The one consideration that the *Report* cites as the most significant for the Columbia River Crossing project is the relationship between the proposed bridge and the “One Engine Inoperative (OEI) elevation at the bridge itself.” *Id.* The *Report* concludes that “the OEI elevation [at the location of the bridge] varies from 280 to 284 feet depending upon the specific alignment of the bridge.” *Id.* at 80-81.
- The *Report* concludes that “this OEI elevation allows for a structure with a nominal height of approximately 160 feet above the bridge deck which is within the parameters of typical tied-arch and cable-stayed bridges.” *Id.* at 81.

***Location of Proposed Bridge*** — The proposed Columbia River Crossing is approximately three miles (less than 20,000 feet) from the nearest runway at PDX.

Pearson Field is a small public-use airport owned and operated by the City of Vancouver. The airport is located east of the proposed bridge in Vancouver, Washington. The single runway at Pearson Field is 3,275 feet long. The existing Interstate 5 bridge is as close as 2,500 feet from the closest runway end at Pearson Field (at its closest point, Interstate 5 is only about 2,000 feet from the Pearson runway). Because of its proximity to PDX, arrivals and departures at Pearson Field are coordinated with air traffic personnel at PDX. Pearson Field lies beneath airspace that is controlled primarily for traffic using PDX.

The proximity of the existing and proposed bridge to any airport is legally relevant in the determination of whether either structure constitutes a hazard to air navigation.

## **LEGAL BACKGROUND**

***Part 77 Requirements*** — Federal law requires that the FAA be given notice of the proposed construction of facilities that could constitute obstructions to the navigable airspace. 49 U.S.C. § 44718(a). The FAA has implemented that statutory requirement through its regulations at 14 C.F.R. Part 77 (Part 77). Part 77 is titled “Objects Affecting Navigable Airspace” and generally sets forth (1) when notice of construction or alteration of physical structures is required; (2) the standards for determining what constitutes an obstruction to navigable airspace; (3) the

Ms. Linda Meng, Esq.

March 3, 2011

Page 4

undertaking of aeronautical studies to determine whether an object is an obstruction; and (4) the rules for hearings regarding aeronautical studies.

Under Part 77, 14 C.F.R. § 77.9, notice to the FAA is triggered by either the height of a proposed structure or its proximity to an airport. Notice is required for:

- any construction or alteration exceeding 200 feet above ground level
- any construction or alteration within three-dimensional “imaginary surfaces” that spread out in all directions from a runway:
  - within 20,000 feet of a public-use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet
  - within 10,000 feet of a public-use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
  - within 5,000 feet of a public-use heliport which exceeds a 25:1 surface
- any highway, railroad or other traverse way whose prescribed adjusted height would exceed the notice standards
- when requested by the FAA
- any construction or alteration located on a public-use airport or heliport regardless of height or location. 14 C.F.R. § 77.9.

The FAA can request notice in other circumstances as well. *Id.* Notice must be filed at least 45 days before construction begins. 14 C.F.R. § 77.7. Cranes and other temporary construction structures and equipment can trigger Part 77 notice just as can permanent structures. 14 C.F.R. § 77.13.

It is important to understand that if a structure triggers the notice requirement under Part 77, it does not necessarily mean that the structure is a hazard to air navigation.

**FAA Determinations** — Once the FAA receives notice under Part 77, it is obligated to make a determination as to whether the proposed structure(s) would constitute a hazard to air navigation. The FAA first measures the distance between any proposed structure and the closest point on the nearest airport runway and determines whether the proposed structure would penetrate any of the three-dimensional Part 77 surfaces emanating from the nearby runways, in which case it would be deemed an “obstruction.” An obstruction is not necessarily a hazard, however. The FAA will

Ms. Linda Meng, Esq.

March 3, 2011

Page 5

account for topographical characteristics and any existing structures that may already obstruct air navigation. This latter point is especially important: a particular structure might, in the abstract, constitute an obstruction through analysis of Part 77 imaginary surfaces but, if a *taller* structure (or natural land form) already exists *closer* to the airport than the proposed new structure, the new structure is said to be shielded by the existing structure. 14 C.F.R. § 77.9(e)(1). No notice is required for shielded structures, *id.* because the FAA has concluded that a shielded structure does not constitute a hazard even if it would, standing alone, constitute an obstruction. For this reason, it is critical that the FAA staff know not only the geographic coordinates of the proposed new structure but also the height of existing structures or hazards closer to the applicable airport runway.

If a proposed structure triggers the Part 77 notice, it is the project proponent's obligation to prepare and submit FAA Form 7460-1 at least 45 days in advance of beginning construction. 14 C.F.R. § 77.7(b). Upon processing the form, if the FAA determines that the proposed structure may result in an obstruction of the navigable airspace or an interference with air navigation facilities and equipment or the navigable airspace, the agency will prepare an aeronautical study. 14 C.F.R. Part 77, Subpart D. The aeronautical study is technical and requires a detailed study by the FAA's Office of Obstruction Evaluation/Airport Airspace Analysis. Ultimately, the FAA will make one of three determinations as a result of such study: that the structure will not pose a hazard to air navigation; that there is a hazard that can be mitigated (i.e., by beacons or lights); or that there is a hazard that cannot be mitigated. The FAA internal procedures for review of Form 7460-1 submissions, determinations, and aeronautical studies are set forth in *FAA Order 7200.2F, Procedures for Handling Airspace Matters.*

The most important—and most time-consuming—procedure contemplated by the Part 77 regulations is the FAA's preparation of an aeronautical study. 14 C.F.R. § 77.27. The purpose of an aeronautical study is for the FAA to make a technical evaluation of the effects of a proposed structure on aircraft operations (the effects on “existing and proposed VFR/IFR aeronautical departure, arrival, and en route operations, procedures, and minimum flight altitudes,” *Order 7200.2F ¶¶ 6-3-2, 6-3-3, 6-3-8*), on nearby public-use airports and aeronautical facilities, and on planned public-use airports. FAA Order 7200.2F sets forth the procedures that FAA staff uses when conducting the aeronautical study and the findings that it can make following such study. Both the Part 77 regulations and the FAA Order provide procedures for appeals from, or administrative challenges to, the FAA determinations resulting from its aeronautical study. See 14 C.F.R. Part 77, Subpart E.

***Effect of FAA Determinations*** — Even if a structure is a hazard to air navigation, the FAA does not have jurisdiction to prevent the construction of any structure. Instead, the FAA's determination under Part 77 is *advisory only*. Only local governments can impose *and enforce* specific height restrictions. In many local jurisdictions, however, zoning codes (and occasionally

Ms. Linda Meng, Esq.

March 3, 2011

Page 6

state laws) prohibit construction within areas that are protected by Part 77 unless the FAA first determines that the construction would not result in a hazard to the navigable airspace. If such codes do not exist or are inapplicable, and the FAA finds that a structure will be a hazard, the FAA is limited to ordering that aircraft operations at the affected airport be altered to avoid any adverse effect on aircraft operations. The FAA cannot order modifications to the design or height of structures.

***One Engine Inoperative Procedures*** — The *Bridge Review Panel Final Report* asserts that, rather than Part 77 surfaces, the key factor relating to the height of the proposed Columbia River Crossing concerns the OEI procedures.

The FAA has published regulations dictating the operating requirements of domestic and international airlines, 14 C.F.R. Part 121, and commuter and on-demand airlines, 14 C.F.R. Part 135. These regulations dictate that airlines must be able to meet the specified obstacle clearance requirements for each type of aircraft they plan to operate at an airport in the event of an engine failure. Airlines can follow either FAA Advisory Circular 120-91, *Airport Obstacle Analysis* (2006), or the International Civil Aviation Organization standards (published as “ICAO Annex 6”) for the operation of the aircraft including the failure of one or more engines. These standards specify the OEI surfaces and identification of obstacles.

It is important to note that airline operators, not the FAA, are responsible for developing OEI procedures for aircraft that they intend to operate at specific airports; the FAA reviews and accepts the OEIs for each operator. OEI procedures are established by each individual airline or operator as part of its FAA-approved operating specifications.

For this analysis, there are two important distinctions between the OEI procedures and Part 77 analysis. First, and most importantly, OEI procedures are not part of, and are not considered in, a Part 77 analysis. *See* 75 Fed. Reg. at 42298. Second, while not part of the FAA Part 77 review, OEI procedures are nevertheless critical for the carriers and airports, *see generally*, FAA, Advisory Circular 120-91 ¶ 7, because changes in those procedures could affect airport capacity if new departure procedures must be adopted that could change runway capacity, aircraft weight or other factors. *Id.* OEI surfaces are not necessarily the same as surfaces protected by Part 77. *Id.*

Third, not only are OEI procedures not part of the FAA’s height and obstruction review under Part 77, there is no formal process for the FAA to assess a potential obstruction to determine if it would affect OEI surfaces. To determine any OEI effect, one would need to consult with all the affected carriers and determine what, if any effect, the structure would have on that particular carrier’s operations. We have not reviewed the OEI procedures for carriers operating at PDX.

Ms. Linda Meng, Esq.

March 3, 2011

Page 7

## **DISCUSSION**

***FAA Processing of Part 77 Filings*** — The FAA receives literally thousands of Form 7460 filings each year. Most of these are routine filings where the distance from the nearest airport allows the agency to make a relatively straightforward determination that, notwithstanding the height of the structure, it will not constitute a hazard to air navigation. Just by way of example, within the City of Portland, there were 38 Form 7460 filings in 2009 and 33 filings in 2010. The height of structures varied from 1,081 feet above ground level (an antenna at 211 N.W. Miller) to only 16 feet above ground level (the second story of a home at 4629 N.E. 57<sup>th</sup>). All of those cases have been resolved and a final determination issued by the FAA.

It may be obvious but needs explaining that the length of time that the FAA takes to review Form 7460 filings and issue its formal determination varies depending upon the complexity of the analysis needed to determine whether the structure constitutes obstruction hazard. (For the simplest cases, the FAA need not even conduct an aeronautical study.) Projects very close and very distant from an airport are generally the simplest and fastest. It is not unusual for the FAA to make a determination in such simple cases within less than 45 days. As an illustration of the typical timeline, final determinations have already been made for all Form 7460s that were filed for structures within the City of Portland before January 1, 2011. Determinations have already been issued for four of the five cases filed already this year in Portland. Of course, a vast majority of all these cases have resulted in the issuance of a Determination of No Hazard and no internal appeal was taken from the initial agency Determination. (Undoubtedly, filings within the City of Portland are not intended to be statistically relevant or even characteristic of filings throughout the country, but these statistics are cited as illustrative of the number of filings and the typical timetable for FAA decisions.)

If the FAA intends to issue a Notice of Presumed Hazard or a Determination of Hazard, the agency review time is likely to be slightly longer than if the location or height of the project makes it obvious that a Determination of No Hazard is appropriate. Nevertheless, the agency usually processes Determinations of Hazard in a matter of a few months absent extraordinary circumstances (such as substantive opposition, uncertainty about non-height impacts to airspace, unique impacts, or other complicating factors). While the agency has no firm deadline for acting, recent experience suggests that it would be prudent to plan on a minimum of 60-90 days for issuance of a Determination. (It is noteworthy that, when the FAA revised its Part 77 regulations in 2010, it revised the filing time for Form 7460. In the prior regulations, Form 7460 was required to be filed 30 days in advance of construction. The agency considered requiring that notice be filed 60 days in advance. The final Part 77 rule, which was effective in January 2011, requires 45-day advance filing, indicating that the agency believes that it can normally complete review of a Form 7460 notice within that time. *See FAA, Safe Efficient Use and Preservation of Navigable Airspace (Final Rule), 75 Fed. Reg. 42296, 42297 (July 10, 2010).*)

Ms. Linda Meng, Esq.

March 3, 2011

Page 8

**Proximity to Pearson Field and PDX** — One complexity concerning the Columbia River Crossing worth noting concerns the location and height of the *existing* Interstate 5 bridge. While we have not reviewed the aeronautical charts for the vicinity (and a detailed analysis of airspace constraints is beyond our expertise), the proximity of the existing bridge to Pearson Field and height of the existing structure makes it almost certain that the existing bridge could constitute an obstruction, and probably a hazard, under Part 77. (FAA records reveal the existence of a bridge structure 2,647 feet from the Pearson Field runway that is 218 feet above the height of the runway (approximately 243 feet elevation); the exact location of the structure is not evident from the FAA records.) Further research would be needed to determine whether the FAA ever issued a Determination of Hazard (or whether mitigation of a hazard has been implemented) with respect to the existing bridge and whether airspace usage in the vicinity has been adapted to the height of the bridge. The *Bridge Review Panel Final Report* asserts that the existing bridge is “grandfathered.” While that is not precisely correct, it is entirely possible that, because of its age, the existing bridge has never been subjected to formal Part 77 analysis.

**Shielding** — The reason that the location and height of the existing bridge is important is that, depending upon the design and specific location of the proposed Columbia River Crossing and the cable-stayed structure, the existing bridge structure could shield a new structure. The precise shielding calculation is beyond our expertise, but an oversimplification of the shielding principle is as follows. If the proposed new bridge is located immediately west (downstream) of, and is lower than, the existing bridge, a *Part 77 filing would not be required at all*. The new structure would be said to be shielded by the existing bridge. The proposed structure may also be shielded even if it is east (upstream) of the existing Interstate 5 bridge if it would be lower than the existing structure. Depending upon the precise geometry, it is also possible that a *slightly taller* structure that is west of the existing bridge could be shielded. (The latter two points are not definitive. The FAA took the position under prior Part 77 regulations that a lower-but-closer structure and a taller-but-farther structure could be shielded in some instances, but the FAA has not yet made any such determinations of which we are aware since the new Part 77 regulations went into effect in January.) The disposition of the existing structure (i.e., would the existing bridge be retained or would it be demolished in connection with the new construction) would also be important since shielding is a practical and not merely theoretical principle. Because of the importance of shielding, we recommend that the CRC project team undertake at least a preliminary engineering calculation to determine whether the proposed new bridge would be shielded by the existing bridge and whether a Part 77 filing would be required at all for a potential cable-stayed design.

**One Engine Inoperative Procedures** — The *Bridge Review Panel Final Report* asserts that the critical criterion for a new bridge is its effect on OEI procedures. While the *Report* states that the OEI elevation “varies from 280 to 284 feet,” the *Report* does not indicate whether the OEI

Ms. Linda Meng, Esq.

March 3, 2011

Page 9

surfaces are identical for all carriers operating at PDX or whether this represents the most restrictive OEI surface for all PDX carriers. In any event, there are three important observations if the *Report* is accurate.

First, if the height of the cable-stayed design, as described in the *Report*, is at, or below, the OEI surface, it would *not* interfere with the carriers' OEI procedures. Second, even if a bridge structure would penetrate one or more carriers' OEI procedures, it is far more important to understand what, if any, effect that would have on their actual operations. Without consulting with the individual carriers, it is not possible to make any conclusions as to the effect, if any, of a structure on actual operations. Because the apparent height of the structure is very close to what the *Report* characterizes as the OEI surfaces in the vicinity, it is entirely possible that a new cable-stayed bridge design would not have any significant effect at all on air carrier operations at PDX. Third, since there is no formal process for review of OEI conflicts, formal resolution of such conflicts, if any, should not delay construction of the bridge.



This analysis is necessarily preliminary since we have reviewed neither the precise plans for the proposed Columbia River Crossing bridge nor other airspace constraints or obstructions in the vicinity of the project that could affect whether a new bridge would constitute either an obstruction or a hazard to use of navigable airspace. We similarly have not reviewed the carriers' OEI procedures for PDX. Should the CRC project team decide to pursue the cable-stayed design further, we recommend that we retain an airspace expert to conduct a preliminary airspace analysis based upon actual conditions at the site and potential designs for the new bridge. We also recommend at least informal consultation with the key carriers who operate at PDX. While such an analysis would not be binding on the FAA, it would provide valuable insight into whether there exists, and the extent of, any *practical* Part 77 or OEI problem with the proposed bridge design.

Sincerely,

Peter J. Kirsch